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Perspectives on growth and poverty

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Perspectives on growth and poverty

Edited by Rolph van der Hoeven and Anthony Shorrocks



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Abbreviations

ACMP	Agricultural Credit Management Programme (Zambia)
CRS	community responsibilities system
DIC	decrease in institutional capital
EEFSU	Eastern Europe and the former Soviet Union
ELF	ethnolinguistic fractionalization
FOS	Federal Office of Statistics (Nigeria)
FSU	former Soviet Union
GDP	gross domestic product
GRC	group representation constituencies
HIE	household income and expenditure
IC	institutional capital
IFPRI	International Food Policy Research Institute
ILO	International Labour Organization
IMF	International Monetary Fund
LSMS	living standard measurement survey
MMD	Movement for Multiparty Democracy (Zambia)
NCS	national consumer survey
NGO	non-governmental organization
NIE	new institutional economics
NIP	non-income poverty
NISH	National Integrated Survey of Households
OECD	Organisation for Economic Co-operation and Development
PARPA	Plano de Acção para a Redução da Pobreza Absoluta (Mozambique)
PRSP	Poverty Reduction Strategy Paper
R&D	research and development

REER	real effective exchange rate
SC	social capital
SSA	sub-Saharan Africa
WBI	World Bank Institute
WIDER	World Institute for Development Economics Research
WIID	World Income Inequality Database
WEF	World Economic Forum
ZCCM	Zambia Consolidated Copper Mines
ZIMCO	Zambia Industrial and Mining Corporation

Preface

Rolph van der Hoeven and Anthony Shorrocks

1 Introduction

The relationship between growth and poverty lies at the heart of development economics. Many see growth of the macroeconomy as both necessary and sufficient for reduction in the incidence and severity of poverty, and consequently focus their efforts on achieving the desired macroeconomic outcomes. Others stress the fact that the benefits from growth may not be evenly spread. In fact, as the critics of globalization often point out, growth at the aggregate level may well have an adverse effect on many of the most vulnerable members of society. Thus the distributional impact of growth, as well as its level, needs to be taken into account when considering the consequences for poverty.

Controversy is not new to this issue. Since the 1950s, the possible adverse distributional effects of growth have been well recognized, often in connection with Kuznets' famous "inverted-U hypothesis", which claims that inequality rises during the initial phases of development, then declines after some crucial level is reached. This prompted efforts in the 1970s to identify pro-poor growth policies that achieve redistribution while at the same time stimulating growth. But the shift in emphasis was reversed a decade later when experience in East Asia and elsewhere again focused attention on the extent to which high growth rates succeed in reducing poverty.

Almost inevitably, the 1990s saw another round of reappraisals and

challenges to established viewpoints, this time responding to evidence that, in many developing countries in Africa, in transition economies, and in Latin America, stabilization and adjustment policies had an adverse impact on poverty, or at best did little to improve the conditions of the poor. Commitments made in the UN Millennium Goals, combined with evidence that inequality and poverty rose in many countries (including some OECD countries) during the 1980s and 1990s, have given another major impetus to efforts to understand the links between growth and poverty better.

In recognition of the importance of these issues, UNU/WIDER organized a major academic conference on growth and poverty in May 2001. Its purpose was to review the current thinking on the topic, to seek and encourage fresh research, and to bring researchers from various backgrounds together to discuss whether the relation between growth, poverty and inequality can be put into a sharper perspective for policy-making. About 50 papers were presented at the conference. This volume contains a selection of those dealing with institutional and policy questions, as well as individual country experiences.¹ Other contributions to the conference (dealing with the nature of disagreements on poverty and growth, and with different views on poverty, growth and inequality stemming from cross-country evidence as well as microeconomic analysis) are being published in a companion volume entitled *Growth, Inequality and Poverty* (Shorrocks and van der Hoeven, eds., 2004, Oxford University Press).

The first two chapters in this volume are concerned with institutions and poverty. These are followed by a set of papers that address sectoral issues related to poverty in the context of education, trade and population. The final group of chapters examine poverty patterns and their links to growth in a diverse collection of developing countries: Mozambique, Iran, Indonesia, Zambia and Nigeria.

2 Institutional development and poverty

In the first chapter, Chu argues that developing countries suffer from inadequate and inefficient institutions or rules, including those that would allow the poor to access product and factor markets. Cultural collectivism in many of these countries, and consequent group-oriented values, factionalism and discretionary rule implementation, stifle efforts to establish well-defined property rights and other rules for efficient economic and political transactions. Chu emphasizes the need to enact rules for government-enforced, widespread impersonal transactions. To this end, efficient economic and political transactions could be promoted as

repeated games. Institutional reform could be aimed at expanding transactions, initially among small, voluntary groups, promoting intragroup governance on the back of the economic agents' group-oriented values. The reforms could also aim to entrust important rule-implementing functions to autonomous, non-politicized agencies, and to induce competing political groups to align their goals with societal, rather than factional, interests. Chu uses current and historical examples from developing countries to illustrate the importance of creating societal goals in the development process.

The following chapter, by Ahsan, focuses on the role of institutions in the fight against poverty, where both "poverty" and "institutions" are broadly interpreted. Ahsan views institutions from the perspective of the "new institutional economics", so that institutions encompass formal rules designed by the polity (including rules in the legal and economic spheres concerning property rights, contracts and liabilities) as well as informal rules that have emerged during the course of civilization. The inclusion of health, nutrition and literacy indicators in defining non-income poverty (along the lines of Sen's capability approach) allows for a rich discussion of policy interventions.

The quality of institutions (as measured by a composite variable called "institutional capital") turns out to be the key factor driving both growth and poverty processes in the countries of Eastern Europe and the former Soviet Union. The (headcount) income poverty measure appears to respond to institutional capital only via growth; institutional quality, however, has a direct impact on the alleviation of non-income poverty. Ahsan argues that inequality must also be taken into account. Rising inequality is likely to mean that more people will lag behind and not benefit from steady growth, even if steady growth is achieved. Initial inequality also has a direct dampening effect on the non-income elements of poverty. He argues that the principal policy interventions should seek to build adequate formal institutions, as well as to create a suitable environment in which informal institutions (such as social capital) can flourish. The focus of the policy debate must be the mutual interaction of both market and non-market institutions in reducing poverty and inequality.

3 Sectoral issues and poverty

Chapter 3, by Addison and Rahman, emphasizes that, if the poor are to benefit from economic growth, then they need the skills that are in growing demand and the capacity to raise their productivity as workers, smallhold farmers and micro-entrepreneurs (and to be remunerated accordingly). Educating the poor not only has direct human development

advantages, but also spreads the benefits of growth and raises the growth rate itself via investment in human capital. Good-quality primary education is especially important in achieving these desirable objectives. Yet Addison and Rahman show that the poor seldom receive a satisfactory education. Too few poor children enter primary school, too many fail to complete their education and the quality of their schooling is often dismal. Girls, especially those from rural communities, are particularly disadvantaged. Taking developing countries as a whole, Addison and Rahman argue that there is insufficient investment in primary education, despite its benefits for the poor and its public good characteristics. Government spending on primary education is too low, both absolutely and as a share of total public expenditure. Parents are often the main source of primary school funding, not the state. In contrast, public subsidies to secondary and tertiary education are generally much higher than to primary education – roughly threefold for secondary education and thirtyfold for tertiary education.

Why is the distribution of public spending in education often skewed away from primary education – the level of education of most benefit to the poor – despite the high private and social returns to investing in good-quality primary schooling? Addison and Rahman argue that the wealth and economic power of the affluent give them a disproportionate influence over the political process, and therefore over expenditure allocations. In contrast, the poor lack the resources with which to lobby and they are less well organized. As a consequence, they are less able to influence governments in their favour. In support of this interest group model, Addison and Rahman find that such skewed public spending is associated with a high level of initial income inequality, thereby perpetuating, and even increasing, income inequality as well as poverty over time. They also find that conflict is significant in skewing public spending away from primary education, and that ethnic diversity tends to reduce the relative share of primary education.

Chapter 4, by Mbabazi, Morrissey and Milner, begins by noting the recent resurgence of interest in the relationships between income inequality and growth, trade policy and growth, and growth and poverty. They explore the relationships between inequality, trade liberalization, growth and poverty in a sample of exclusively developing countries. They find moderately robust evidence for a negative effect of inequality on growth in the long run, but no significant effect in the short run. However, the strength of the long-run effect is sensitive to the sample and specification, suggesting that inequality is only one of several policy distortions that retard growth, and that the relationship between inequality and growth in some countries is quite different from the norm.

Although trade liberalization appears to have a consistent and

significant positive association with growth, there is no evidence that inequality, growth or trade liberalization are significant determinants of cross-country variations in poverty. However, the authors find consistent evidence that, controlling for most other variables, countries in sub-Saharan Africa experience below-average growth performance and have higher inequality and higher poverty. Although the empirical relationships are fragile, the analysis shows that the fundamental determinants of inequality and poverty are country-specific factors not easily captured in cross-country regressions. The authors therefore caution against making any broad generalizations about how inequality, growth and poverty are related.

Chapter 5, by Mayer-Foulkes, shows that the distribution of life expectancy across countries has an evolving twin-peaked pattern, with some countries shifting between peaks in the period from 1962 to 1997. To draw out the implications for development, he models life expectancy in terms of physical and human capital and technology, the fundamental economic variables described by theories of economic growth. Using a Solow growth model and a convergence club framework, he shows how a multiple convergence club structure can be used to define states of development, and he proceeds to demonstrate that it must be reflected in changes in life expectancy over time. Through visual examination, and by applying various specification tests, he concludes that the empirical cross-country distribution of life expectancy for the period 1962–1997 is best described using a convergence club structure. This gives strong empirical support to the view that only growth theories involving convergence clubs can explain the process of development, and thus that the specification of development models needs to take the findings of convergence clubs analysis into account.

4 Country analysis

In the sixth chapter, San Martin generates a disaggregated map of poverty and living conditions in Mozambique by combining data from a nationwide survey of living standards and a national population and housing census. This helps to overcome the problem, common until recently, that most nationwide studies of poverty are too general to support the design of policy interventions at the local level. San Martin disaggregates expenditure-based indicators of poverty for the whole country and assesses geographical targeting schemes based on different ranking criteria. He argues that this analytical tool can be a useful contribution to the design of poverty alleviation strategies by narrowing the scope of action to the localities where the poor actually reside.

The following chapter, by Assadzadeh and Paul, examines the changes in poverty in Iran during the post-Islamic period. More specifically, the authors investigate the contributions of growth and redistribution factors to changes in poverty over the period from 1983 to 1993. The decade saw poverty decline slightly in rural Iran but increase by more than 40 per cent in the urban sector. Assadzadeh and Paul argue that the high rate of increase in urban poverty in Iran creates a need for government action to initiate effective poverty alleviation programmes.

To obtain a clearer picture of the impact of poverty alleviation programmes, the authors decompose changes in poverty over time into growth and redistribution components in both the urban and rural sectors. In each sector they find that the redistribution component was positive during 1983–1993, indicating that the change in income inequality tended to increase the poverty level. The growth component, however, affected the two sectors differently: it was negative for the rural sector, tending to reduce poverty, but positive for the urban sector, reinforcing the contribution of rising inequality. The authors conclude that policies are required to reduce inequality in both urban and rural areas in Iran.

In Chapter 8, Fane and Warr investigate whether changes in poverty and inequality depend directly on the rate of economic growth, or whether the source of growth also matters. A computable general equilibrium model of the Indonesian economy is used to explore this question by simulating increases in GDP arising from (i) technical progress in five broad sectors of the economy and (ii) the accumulation of six types of physical and human capital. Fane and Warr find that a given amount of growth reduces poverty and inequality by a greater amount if it raises the returns to the factors that are more important sources of income for the poor than for the non-poor. Different sources of growth affect poverty and inequality differently because they affect factor returns differently and because the poor and the non-poor own factors in different proportions.

Chapter 9, by McCulloch, Baulch and Cherel-Robson, documents the dramatic transformation of economic policy in Zambia during the 1990s. The election in 1991 of the Movement for Multiparty Democracy government saw the introduction of a series of major economic reforms designed to change the Zambian economy from a relatively inward-looking and state-dominated economy to an outward-oriented economy based upon private enterprise. Sharp stabilization early in the decade was followed by reforms to open the economy to the rest of the world, including exchange rate liberalization, trade liberalization and capital account liberalization. In addition, a set of structural and institutional reforms was initiated, including reform of agricultural marketing, a large privatization programme, and reforms to the public sector. The authors describe the

economic reforms of the 1990s and analyse household survey data from three of the latest nationally representative household surveys in Zambia in order to chart the impact of these reforms on poverty and inequality. They find that macroeconomic stabilization combined with early failed attempts at agricultural marketing liberalization caused a dramatic increase in poverty in urban areas between 1991 and 1996.

In the final contribution to the volume, Okojie examines the linkages between the sex of household heads, education and household poverty in Nigeria between 1980 and 1996. She uses aggregate household data drawn from four national consumer expenditure surveys and takes mean per capita household expenditure to be the indicator of poverty. Figures for the depth and severity of poverty, as well as the headcount ratio, are generated using the Foster, Greer and Thorbecke indices, and trends in inequality are analysed using the Gini coefficient and various entropy indices. Okojie's analysis shows that the headcount poverty rate increased from 27 per cent in 1980 to 67 per cent by 1996. Furthermore, calculation of the Gini coefficient and the entropy indices show inequality to be fairly high in Nigeria. Controlling for the relevant variables, multivariate analysis reveals that female-headed households are more likely to be poor in all survey periods. Furthermore, education decreases the likelihood of being poor, and larger households are more likely to be poor.

5 Conclusion

Although the chapters in this volume cover a range of opinions, some general conclusions can be drawn. The first, perhaps, is the difficulty of drawing overall conclusions. Many of the papers show that general remarks such as "growth is good for the poor" or "education is good for the poor" can be supported by cross-country regressions. But, because these observations have few or no policy implications, such statements tend to blur the debate rather than illuminate it.

What the chapters in this volume have shown, each in its own context, is that initial conditions matter, institutions matter, specific country structures matter and time horizons matter. Initial conditions affect the speed at which growth can reduce poverty. Initial conditions, institutions and the structure of the economy also affect whether policies have a pro-poor or an anti-poor outcome – trade liberalization was mentioned as a case in point. Improved education is an end in itself, and can also contribute to reducing poverty; but its effect on inequality depends on supply and demand factors, which differ significantly across countries.

Since the appropriate poverty reduction strategies are so country and context specific, it seems clear that creative national solutions need to be

encouraged, as some of the country case-studies convincingly argue. However, an emphasis on national policies also implies national ownership of such policies. Although the term “ownership” has recently acquired some negative connotations,² we use it here to refer to the benefits of ownership of policy analysis and an informed policy debate. It is to be hoped that such a debate might lead to a more pro-poor set of development policies if consensus between different interest groups at the national level can be reached. It might also lead to a sharpening of the issues and the various policy options without a consensus being reached. In either case, issues of poverty and inequality will have been put at the centre of public concern.

It is the task of WIDER and other UN research institutes to assist in such a debate and this is what this volume attempts to do.

Notes

1. Each of the papers was refereed, revised and edited for this volume.
2. In negotiations with developing countries, international financial institutions have often insisted that countries “own” their economic and fiscal policies, although these may well have been drawn up by the IFIs themselves.

Collective values, behavioural norms and rules: Building institutions for economic growth and poverty reduction

Ke-young Chu

1 Introduction

Countries reduce poverty by achieving economic growth. This is how the Western world and, more recently, Japan and newly industrialized countries have reduced poverty. Countries achieve growth by building efficient economic and political institutions, defined by North (1990, 1994) as humanly designed rules, which promote the productive activities of economic agents by enhancing allocative efficiency at low enforcement costs. Essential elements of institution-building for economic growth and poverty reduction are the development of transaction institutions, particularly those aimed at allowing economic agents, including the poor, to access product and factor markets, as well as ensuring the efficiency of rules and their non-discretionary implementation.

Developing countries often have inadequate, inefficient formal rules (for example, a contract law, tax laws, an election law, a constitution). Rules are inefficient because they are products of political competition aimed at short-run factional interests. More often, however, developing countries fail to enforce reasonably efficient formal rules. Western formal institutions, with their roots in individualism, transplanted to developing countries, often do not function as intended in a group-oriented culture. A result is a large and widespread discrepancy between *de jure* and *de facto* rules. The group-oriented social interactions that yield

factionalism are not only a political problem but also a cultural problem. Incompatibility between formal institutions and informal norms in developing countries is not a knowledge problem but a values problem. Discretionary rule implementation is not necessarily a result of bad intentions; it is often rooted in well-intentioned actions of paternalistic ruling élites.

This chapter combines the recent contributions of North (and other new institutional economists) and Hofstede (and other culture researchers) to suggest issues that need to be considered in building institutions for economic growth and poverty reduction. Defining institutions as rules, North has analysed their role in the economic performance of different societies through time. Hofstede (1997) has analysed different societies' dimensions of culture and their human behavioural implications. An integration of these contributions can provide a useful way to look at economic growth and poverty reduction processes.

The chapter has a twofold objective: (1) to analyse the implications of collective values for how human beings behave and how institutions function and (2) to identify issues that need to be considered in building transaction institutions in the countries that have not yet established mature market institutions. The aim is to assess the implications of a society's collective values for the operation and development of its economy and to suggest an approach to building institutions for growth and poverty reduction.

Section 2 reviews the empirical findings on the relationship between rules and economic growth. Sections 3 and 4 provide an overview of the findings of recent research on values and behaviour and suggest their economic implications. Sections 5 and 6 draw on this analysis and contemporary and historical experiences to identify issues that need to be considered in making and implementing rules for growth and poverty reduction in culturally collectivist societies. Section 7 provides conclusions.

2 Institutions as rules and economic growth and poverty reduction

Using a game theory analogy, North defines institutions in terms of formal and informal rules of the game for individual and organizational interactions. Formal rules include a legal system and policy measures; informal rules include norms of behaviour and self-imposed codes of conduct. Efficient rules, by providing proper incentives and establishing a

stable structure of human interactions, encourage individuals to engage in productive activities, thus promoting economic growth.

2.1 The process of institutional development

Explaining how institutions change is a demanding interdisciplinary task. The process of institutional development, largely based on North (1990, 1994), and drawing also on Hofstede (1997) and others, may be sketched as follows.

Beliefs, values and institutions

Institutional development is a learning process. Human beings learn by developing mental models and forming beliefs, through which they interpret their experiences. Shared mental models and beliefs provide a basis for a culture, which manifests itself in collective values (a broad tendency to prefer certain states of affairs over others), rituals (collective activities) and symbols (languages and other means of expression). Values can promote rational thinking; they can also create dogmas and prejudices (see North, 1994; Huntington, 1996; and Wilk, 1996). If a culture were a multi-layered sphere, values – both terminal (for example, regarding freedom, happiness) and instrumental (for example, regarding courage, honesty) – would be its innermost core; rituals and symbols its outer layers. Values change only slowly; symbols less slowly. Given their beliefs, human beings develop institutions to structure their interactions. Beliefs and institutions thus created are not, in and of themselves, efficient and growth promoting.

Institutional change and institutional entrepreneurs

Institutions change as a result of interactions among rules of the game, organizational or individual players of the game, and institutional entrepreneurs, who respond to various signals to bring about institutional innovations. The signals are not necessarily economic (a change in relative prices, for instance); ideas, as well as vested interests, matter. Interactions among institutional entrepreneurs and leaders of groups are important. Institutional entrepreneurs combine ideas and political visions to introduce sustainable, more efficient new rules (for example, a new constitution, tax law).

2.2 Stages of development of institutions for economic and political transactions

Through history, a country's transition to a mature market economy has passed through broadly two stages.

1. *Transactions without adequate third-party enforcement*

The development of institutions for economic transactions in this stage takes two phases. In the first phase, intracommunity transactions rely on personal ties.¹ Specialization is minimal and living standards are low. In the second phase, intercommunity transactions take place with inadequate intercommunity institutions. Political transactions also can take place without third-party enforcement. Political groups often engage in competition without a well-defined, tightly enforced legal framework (for example, an effective election law).

2. *Widespread impersonal transactions with third-party enforcement*

In this stage, a coercive government provides efficient institutions for impersonal intracommunity and intercommunity economic transactions throughout a nation-state. A low-cost transaction system provides opportunities for specialization. Legal and other rules with third-party enforcement also govern intergroup and intragroup political transactions. Political groups compete and transact within a framework enforced by a third party (North, 1990: 12).²

Game-theoretic characterization

Institutional development is a process of agents' learning to engage in transactions. Non-cooperative game theory offers two models to characterize the conditions underlying the operation of institutions in the first stage of institutional development, with no adequate third-party enforcement. The first model explains how intracommunity transactions take place when the game is repeated, when the players possess information about other players and when the number of players is small.³ The second model explains how intercommunity transactions take place relying on contagious punishments, in which a single member's violation of codes of conduct triggers a retaliation by opponent players against all members of the violator's community (for example, Kandori, 1992). These conditions are not easy to achieve for a large economic space. Widespread intercommunity transactions that allow efficient specialization are not feasible without transactions with third-party enforcement. Cooperative game models show that an enforceable contract can bring about Pareto-optimal improvement for the players engaged in a Prisoner's Dilemma.

2.3 *Efficient rules and economic growth and poverty reduction*

Only efficient institutions promote growth. Affluence in developed countries is a cumulative result of efficient formal and informal rules; poverty in poor countries, of inefficient rules. For institutions to function well, formal rules should be nested in hospitable informal rules (or norms), which provide legitimacy to them.

Rules versus discretion

To promote productive investments and other activities, rules (for example, laws, policies) should be stable, allowing economic agents to predict how these rules will affect the returns to their investments. To satisfy this requirement, rules should be interpreted and implemented without discretion, which creates a damaging environment for productive investments and other activities.

Rules and economic growth: Empirical studies

Recent research efforts have postulated and empirically estimated the relation between economic growth and measures of institutional efficiency. For example, the World Economic Forum (WEF) has assessed the economic growth prospects for each of the more than 50 countries in its database by using its competitiveness index, which reflects the country's institutional efficiency (Sachs and Warner, 1996). In a similar effort, Brunetti, Kisunko and Weder (1998) have postulated that economic growth is determined by the predictability of rules and a number of other more traditional factors, including educational attainment, inflation and trade.

Institutions and poverty reduction

A constraint on poverty reduction in many developing countries is inadequate, inefficient transaction institutions. For many smallholders and micro-entrepreneurs, inadequate access to microcredit institutions, in addition to inadequate skills, is a critical constraint on an increase in production. Small shopkeepers may not hire poor jobseekers because they do not have confidence either in the jobseekers' integrity or in the country's legal system. These are merely a sample of possible cases in which inadequate institutions are a critical constraint on an immediate reduction in poverty. In many cases, these are binding constraints.⁴

Unresolved questions

The formulations linking institutions to growth do not reveal how formal and informal rules are related. The strength of rules is simply a composite index of measures of the strength of individual rules. They do not suggest why some countries have been able to establish an effective rule of law, but others have not. Moreover, it is important to explore how developing countries should build (a) efficient institutions in general and mechanisms for ensuring their non-discretionary implementation and (b) transaction institutions that would allow smallholders, micro-entrepreneurs and impoverished jobseekers to access credits and product or labour markets.

3 The implications of collective values for behavioural norms and rules

3.1 Determinants of human behavioural norms

Three levels of uniqueness of human mental programming

Hofstede's (1997, 2001) extensive analysis of the world's cultures offers a useful approach to understanding why a rule of law prevails in some countries but not in others.⁵ Hofstede notes that there are three levels of uniqueness in human mental programming: human nature, culture and personality. Human nature is universal and is inherited. Culture is specific to a group (for example, an extended family, a political party, the alumni of a university, or the residents of a town or a country) and is learned.⁶ Personality is specific to an individual and is both inherited and learned.

Dimensions of culture

Hofstede's approach reduces the study of culture to manageable proportions by focusing on four quantifiable dimensions of culture: collectivism–individualism, power distance, uncertainty avoidance and masculinity–femininity. The analysis of these dimensions suggests channels through which culture affects human behaviour, with regard to relations among individuals, between individuals and groups, and among groups in their use of rules. This chapter focuses on only the first three, and particularly on the first two, relating them to economic growth: individualism–collectivism (IC) indicates the tendency for members of society to value individual interests over collective interests;⁷ power distance (PD) indicates the degree to which members expect and accept that power is distributed unequally; uncertainty avoidance (UA) indicates the degree to which members tolerate uncertainty.

3.2 Collective values and general behavioural norms

On the basis of surveys consisting of a series of questions, Hofstede (1997) estimates IC, PD and UA indices for 53 countries.⁸ One of his key findings is that the IC index is negatively correlated with the PD index, whereas the UA index is largely independent of both the IC and PD indices. The countries with an individualist (collectivist) culture tend to have a small (large) PD. Hofstede's IC index measures the degree of individualism in a society, a high index implying a high degree of individualism.⁹

Individualism–collectivism and power distance

Table 1.1(a) contrasts general human behavioural norms in a collectivist culture (and with a large PD) with those in an individualist culture (and with a small PD). The IC index suggests general behavioural norms of individuals in relation to their groups. These norms indicate that, in a collectivist culture (with a large PD), (i) members of society tend to value group interests over individual interests and to accept authoritarian and paternalistic leaders; (ii) personal ties among members of a group play important roles; (iii) personal rule, which is by nature discretionary, tends to prevail rather than a rule of law; and (iv) group rivalry and factionalism within a society are pronounced.¹⁰ By comparison, in an individualist culture (with a small PD), members of a group tend to value their own interests over group interests, to rely more on formal rules than on personal ties, and to prefer resourceful, democratic leaders. Those in authority are expected to lead by rules rather than by discretionary, paternalistic actions.¹¹

Uncertainty avoidance (UA)

The UA index indicates the extent to which individuals try to avoid uncertainty. In a culture with strong UA, people have an emotional need for rules and, therefore, tend to rely on formal rules, even if the rules do not work; their rules tend to be numerous and precise. In a culture with weak UA, by contrast, individuals tend to accept uncertainty and have relatively little need for formal rules (see Table 1.1(b)).

IC, PD and UA across countries

According to Hofstede, the PD and IC indices are negatively correlated. Generally, Western civilization countries have an individualist culture (a high IC index) and a small PD index. Countries in the rest of the world tend to have a collectivist culture and a large PD index.¹² Whereas collectivist countries tend to have strong UA, individualist countries are scattered over a wide range of the UA scale.

3.3 Cultural collectivism, a large power distance and rules

Cultural collectivism has clear economic implications.

Reliance on personal ties

Intragroup personal ties play an important role in economic, social and political interactions. Repetitively reciprocal transactions tend to be based on personal ties rather than formal and impersonal rules.

Table 1.1 Dimensions of culture and general human behavioural norms
 (a) Individualism–collectivism (IC) and power distance (PD) dimensions

	Collectivist/large PD	Individualist/small PD
<i>Interpersonal relationship</i>		
Individual identity	Based in the social network	Based in the individual
Virtues in interpersonal relations	Harmony	Speaking one's mind
Relationship and task	Relationship over task	Task over relationship
Inequalities among people	To be expected and desired	To be minimized
Prevailing ideology	Equality over individual freedom	Individual freedom over equality
Consequence of trespassing	Shame	Guilt
Privileges	Justified for the powerful	Not justified for the powerful
Communication	High context	Low context
<i>Relationship between individuals and group</i>		
Prevailing interest	Collective	Individual
Societal goals	Harmony and consensus	Self-actualization
Loyalty to group	Strong	Weak
Preferred organization	Centralization	Decentralization
<i>Intergroup relationship</i>		
Laws and rights	To differ across groups	To be the same across groups
<i>Leadership</i>		
Ideal boss	Benevolent autocrat	Resourceful democrat
Guiding value	Authoritarian	Democratic
<i>State</i>		
Role of state	Dominant	Small
Political power	Exercised by interest groups	Exercised by voters
Governance	Personal rule Discretion	Rule of law Rules
Sources of power	Ability to use force Family and friends	Ability to give rewards Formal position
Means of reform	Changing top people	Changing rules
Prevailing philosophy	Hierarchy and stratification	Equality

Ambiguous rules and discretionary rule implementation

Cultural collectivism can help members of a society avoid tragedies of commons. However, group-oriented values and discretion are often an obstacle to an effective system of well-defined property rights. They can

Table 1.1 (cont.)

(b) Uncertainty avoidance (UA) dimension

	Strong UA	Weak UA
<i>Dealing with uncertainty</i>		
Uncertainty	Feared	Tolerated
Rules (and laws)	Emotional need for rules, even if they do not work	Minimal need for rules
Innovation	Many and precise Resisted	Few and general Tolerated
<i>Truth and ideology</i>		
Truth	Absolute	Relative
Ideology	Nationalism	Internationalism

Source: Compiled from Hofstede (1997).

Note: Expecting inequalities among individuals prevails in a culture with a large PD, whereas the ideology of preferring equality to individual freedom prevails in a collectivist culture. Although prevailing values in culturally collectivist societies, in general, are compatible with those in societies with a large PD, these two values appear to be contradictory. Note, however, that the prevailing ideology compares equality with individual freedom, not a higher degree of inequality with a lower degree of inequality.

also be a source of discretionary enforcement by government of well-defined formal property rights. This can be true between the government and the private sector, among private groups, and within families. Governmental discretion discourages efficient transactions and can promote corruption.¹³

Governmental paternalism

A large PD index in a collectivist culture implies a tendency toward governmental paternalism.¹⁴ Paternalistic government, which under wise leadership can correct some market failures, not only justifies governmental intrusion into the personal activities of individuals but also gives rise to public expectations of paternalistic government intrusion. In South Korea, a culturally collectivist country with a large PD index,¹⁵ the government promoted industrialization through directed lending and other administrative support (Amsden, 1989). A direct governmental push for private entrepreneurs to commit to large investment projects inevitably creates expectations of a possible future bailout, leading to excessive investments supported by government-directed bank loans, low business profitability in certain sectors, and an accumulation of non-performing bank loans.

Group rivalry

Group orientation can mean intragroup cohesion,¹⁶ but it can also mean intergroup rivalry and conflicts. Consensus might not be easy to obtain because of the conflicts among different interest groups, whose respective members tend to have fierce group loyalty.¹⁷

Game-theoretic characterization

In Axelrod's tournaments of repeated games of Prisoners' Dilemma in which players are asked to choose either "cooperation" or "defection", the dominant strategy was Tit for Tat (TFT), a strategy of starting the game with a cooperative action but responding to the other player's action with the same action (Axelrod, 1984). Whereas Axelrod's experiments focused on individualist agents, who would apply TFT against each of their opponents without discrimination, other game-theoretic experiments have shown how the results would change when agents' behaviour is group oriented. Group-oriented agents would use Discriminatory TFT (DTFT) – a strategy of applying TFT against the members of their own group but opting for a defection against all outsiders all the time. Experiments have shown that DTFT is the dominant strategy in games of group-oriented players (Poundstone, 1992). Thus, individual agents in group-oriented societies have an incentive to be group oriented in addition to peer pressure, as discussed later in this chapter.

3.4 Rules and dimensions of culture: Illustrative cross-country analysis

If culture influences the effectiveness of the rules that govern a society, how strong is the statistical evidence? Tables 1.2 and 1.3 present the results of a statistical analysis that combines databases from Hofstede's measures of national individualism–collectivism, power distance and uncertainty avoidance indices and from the WEF's measures of three national indices of the effectiveness of rules: the effectiveness of the rule of law (represented by a composite index of judiciary independence, soundness of property rights and independence of the legal framework), the efficiency of government regulation (measured as the inverse of regulatory burden) and tax compliance (measured as the inverse of the degree of tax evasion). The sample comprises 42 countries for which data are available from both sources.

Overview: The West and the rest

Table 1.2 provides an overview of the averages for two country groups: the countries that belong to Western civilization and the rest of the

Table 1.2 Dimensions of culture and the effectiveness of rules

		Dimensions of culture			Effectiveness of rules		
	Sample countries	IC	PD	UA	Rule of law	Regulatory efficiency	Tax compliance
Mean		48.0		64.5	5.3	3.6	3.7
SD		25.6		24.3	1.1	0.7	1.1
Range		12–91		8–112	2.8–6.7	2.2–5.2	2.4–6.1
West	20–22	70	37	60	6.2	3.7	4.0
Rest	21–25	25	72	71	4.0	3.1	2.8

Sources: Hofstede (1997) and World Economic Forum (2000).

Note: The number of countries used for the averages varies across country groups and indicators. A high index = individualism is widespread in society; large PD prevails; strong UA; effective rule of law; high regulatory efficiency; high tax compliance.

world. The first three columns report the average IC, PD and UA indices; the second three report the average indicators of the rule of law, regulatory efficiency and tax compliance. The West has an individualist culture with a high IC index (70 versus 25) and a small PD index (37 versus 72). The West tends to have a smaller UA index (60 versus 71) and a higher rule of law index (6.2 versus 4.0) than the rest. These results are consistent with a higher index of regulatory efficiency (3.7 versus 3.1) and a higher index of tax compliance (4.0 versus 2.8).¹⁸ Western countries achieve higher tax compliance than the rest of the world despite higher statutory tax rates.

Rule of law

Equation (1.1) postulates that the rule of law (r) is a function of individualism (i):

$$r = f(i). \quad (1.1)$$

On the basis of Hofstede's analysis, countries with a high individualism index should tend to have a high rule of law index. Table 1.3 reports the results of regressions that postulate that the three indicators of the effectiveness of rules are explained by some of the dimensions of culture. Alternative functional forms yield statistically significant coefficient estimates with the correct sign. Individualism "explains" the rule of law with a large t -ratio for the coefficient and an adjusted R^2 exceeding .500.¹⁹

Table 1.3 Dimensions of culture and the behaviour of economic agents (42 individualist and collectivist countries)

	Explanatory variables							Average statutory tax rate	Adjusted R^2
	Central tendencies of independent variables			Constant	Individualism	UA	Rule of law		
Mean					48.0	64.5	5.3	21.7	
SD					25.6	24.3	1.1	7.0	
Range					12–91	8–112	2.8–6.7	6.9–36	
<i>Dependent variable</i>		<i>Mean</i>	<i>SD</i>	<i>Range</i>					
Rule of law		5.3	1.1	2.8–6.7	3.659 (15.22)				.581
Regulatory efficiency	(1)	3.6	0.7	2.2–5.2	2.200	0.034 (7.60)	0.259		.165
	(2)				(4.76) 4.301 (15.57)		–0.011 (–2.84)	(3.02)	.147
	(3)				3.069 (4.64)		–0.008 (–1.79)	0.188 (2.04)	.209
Tax compliance	(1)	3.7	1.1	2.4–6.1	4.608			–0.043 (–1.78)	.050
	(2)				(8.38) 0.328 (0.51)		0.635 (5.31)		.399
	(3)				1.328 (2.15)		0.710 (6.74)	–0.064 (–3.80)	.429

Sources: Regressions based on data from World Economic Forum (2000) and Hofstede (1997).

Note: The two numbers reported for each explanatory variable and each equation are the estimated coefficient and associated t -ratio (in parentheses).

Regulatory efficiency and tax compliance

Equations (1.2) and (1.3), respectively, relate regulatory efficiency and tax compliance to cultural factors:

$$e = g(u, r) = g(u, f(i)) \quad (1.2)$$

$$c = h(r, t) = h(f(i), t) \quad (1.3)$$

Equation (1.2) postulates that regulatory efficiency (e) is a function of UA (u) and the rule of law (r). Countries with a high degree of UA would tend to have a complicated regulatory regime; however, an effective rule of law limits its negative effect on regulatory efficiency. The countries with no effective rule of law tend to use governmental discretion, which reduces regulatory efficiency. Equation (1.3) postulates that tax compliance (c) is a function of the rule of law (r) and statutory tax rates, represented by an average statutory tax rate (t). An effective rule of law would help a country increase tax compliance. However, other things being equal, high statutory tax rates would encourage tax evasion.²⁰ The estimation results support these hypotheses.

Reverse causation

The rule of law, high regulatory efficiency and high tax compliance are all-important foundations for economic growth. Therefore, the statistical analysis suggests positive implications of individualism for economic growth. However, one might ask whether causation runs in the reverse direction. Rather than individualism leading to a rule of law and economic growth, does economic prosperity provide a society with the resources to build a rule of law? Do economic growth and urbanization undermine group cohesion? Although these are plausible hypotheses, evidence indicates that the emergence of individualism in the West preceded economic growth. Symptoms of individualism in the West emerged as early as ancient Greece and biblical times (Frost, 1962: 179; MacFarlane, 1987: 196), although this intellectual development did not become a widespread belief. Anthropologist MacFarlane's (1987) research indicates that English society had manifestations of individualism in the thirteenth century.²¹

3.5 Questions

This section has argued that individualist and collectivist values have different behavioural implications. Research in game theory, however, raises important questions about the relevance of this distinction. Some game theorists (for example, Kandori, 1992) have advanced models

based on contagious sanctions to explain these intercommunity behavioural patterns for agents with individualist values.

Do human beings, by nature, pursue self-interest? This is the view of human beings in most economic models. This section argues that cultural values, which human beings acquire through learning, often lead people to behave differently in different societies. Individuals in culturally collectivist societies, although having varying degrees of self-interest, are guided by group-oriented values and their behaviour is constrained by social norms that stress the importance of group interests.

The individualist agents in Kandori's model, as well as agents in culturally collectivist societies, can use mutual contagious sanctions to sustain intercommunity transactions. This observational equivalence between individualist and collectivist societies in intergroup or intercommunity behavioural patterns, however, does not imply that the values and social norms do not matter. As Greif (1994) has shown, the intracommunity institutions in individualist and collectivist societies will differ from each other; the former would tend to rely on formal rules, the latter on personal ties.

There are other questions. How have some of the culturally collectivist countries achieved growth? Among the world's wealthiest countries and regions are Japan, Hong Kong's Special Administrative Region, and Singapore. Korea and Taiwan Province of China too have achieved impressive growth records. These countries are all culturally collectivist. In response to these questions, one should point out that growth is a multi-dimensional phenomenon. This section highlights the implications of (a) values for rules and (b) rules for growth. There are factors other than rules that affect growth and factors other than values that affect rules. Although a rule of law and rule-based transactions are critical for growth, so are human capital, high savings and work efforts. These countries' rules, at least some of them, must have been more efficient, transparent and stable than those in less prosperous countries. It is also obvious that many of these middle-income countries face challenging institutional reform tasks. Unless they successfully meet these challenges, they may not continue to enjoy sustained growth.

If a rule of law is essential for economic growth, but is not readily achievable in a collectivist culture, and if culture changes only gradually, can poor countries ever achieve long-term economic growth? Some have argued that culture should be changed. For example, Etounga-Manguelle (2000) advocates a "cultural revolution" in education, politics, economics and social life. In Japan, a prime ministerial commission notes: "we [Japanese] cultivated ethical norms extolling social and organisational harmony. Socioeconomic affluence and internationalisation, however, made it difficult to sustain such ethical norms unchanged ... How can the

power of individuals be better utilised? ... Here we outline two essential changes. One is to change the methods and systems whereby citizens interact with society ... The other essential change is ... promoting individuality and individual initiatives" (PMC, 2000: 1–2).²²

One might argue that, with the process of globalization, cross-country cultural diffusion would lead to increasingly individualist tendencies in the developing world. However, it is not revolution but evolution that transforms culture, particularly the values that comprise its innermost core.²³ The diffusion will take time. Therefore, it becomes essential to explore the following questions: (1) How do developing countries with a collectivist culture cope with institutions inadequate to promote growth? (2) How do they build a system based on rules, rather than on discretion, while still remaining collectivist in their cultural orientation? (3) In particular, how do they build public institutions that can overcome group rivalry and factionalism in their culture?

4 Coping with inadequate transaction institutions for growth and poverty reduction

4.1 Developing countries: Institutional reality

Developing countries must go through a long process of institutional development. Establishing sound formal institutions takes time.²⁴ It requires technical expertise as well as social consensus; some institutions (for instance, an expanded social protection programme) require financial resources to become established. Although developing countries can import formal institutions from developed countries relatively quickly, intercultural transplantations of informal norms take much longer. This is the most difficult problem facing developing countries in establishing an economy based on rules and promoting economic growth.²⁵

Western industrial countries have developed their formal and informal institutions over several hundred years. The largely evolutionary nature of the development of formal and informal institutions in the Western world has ensured that they are mutually compatible. Imported alien constitutions, tax laws, election laws and other formal institutions in developing countries often clash with local values.

4.2 Coping with inadequate transaction institutions: Examples

Through history, societies have responded to institutional needs in a variety of ways with varying degrees of success. For example, agents began to form a network of personal ties. Following the breakdown of the

Soviet Union, many former Soviet countries, without effective market institutions, saw an emergence of business networks. The transactions among members of a network are essentially intracommunity in nature, even if the partners are geographically far apart (Kali, 1999).²⁶ These are not necessarily efficient and growth-promoting. There have been interesting episodes involving intracommunity enforcement for intercommunity transactions. The following episodes, wide apart in time and space, have remarkably common features:

Community responsibilities system (CRS)

During the commercial revolution, traders in European communities engaged in intercommunity trade, without formal intercommunity institutions, by relying on the CRS. For example, merchants in Genoa or Venice traded with merchants in Constantinople or London without an intercommunity legal contract enforcement system governing their transactions and without knowing the merchants personally. Under the system, a failure by a member of one community to honour contracts with a member of another community mobilized the latter community's collective sanctions against all members of the former community (Greif, 1997).²⁷

Grameen Bank

In Bangladesh, the Grameen Bank has successfully instituted a micro-financing programme by introducing groups of rural villagers to credits, step by step, through a learning process in a repeated borrowing-and-repaying game, in which members of a group provide one another with "peer support in the form of mutual assistance and advice" and "discipline" (Yunus, 1999). The Grameen Bank has relied on a mix of punishments, threats of punishments and incentives, as well as traditional and modern institutional approaches. For example, while relying on de facto cross-guarantees based on intracommunity personal ties and discipline for loan collection, the bank has rotated loan officers geographically to prevent them from developing personal ties with borrowers.²⁸

Chaebol system

A chaebol group in Korea is a collection of large and small, legally separate, vertically and horizontally linked corporations managed by a mix of hired and owner executives controlled by an owner-family, usually headed by a paternalistic chairman. A group's influence extends to a large number of small subcontractors and suppliers, which often have exclusive business relations with the group.²⁹ Chaebol groups were the means for Korean entrepreneurs to overcome the weakness of the Korean financial and other transaction systems.³⁰ Banks loaned to

chaebol firms partly because the banks and chaebol groups had an understanding that the firms belonging to each chaebol were collectively liable for their individual borrowings through cross-guarantees and chaebol chairmen's de facto authority over intra-chaebol financial transactions (Amsden, 1989). These and other advantages in accessing bank loans may have outweighed the inefficiency arising from excessive diversification and inadequate specialization. Chaebol groups benefit from vertical integration, through ownership and de facto control of marketing channels, suppliers and subcontractors.³¹

The emergence and operation of chaebol groups cannot be fully explained without discussing the role of cultural collectivism and a large power distance (PD) index. Chaebol chairmen tend to manage their groups in a paternalistic, discretionary and group-oriented manner. Owner-founders tend to hand over not only the ownership but also the management of their corporations – some of which operate globally – to their sons, not necessarily through a vigorous competition to choose the best managers.

Limitations of intracommunity enforcement mechanisms

The CRS could not support a broad expansion of trade in medieval Europe. As the size of communities increased, the system began to face a number of difficulties: the ease of falsification of community affiliation; adverse selection; and insufficient incentives for lenders to examine the creditworthiness of individual borrowers (Greif, 1997). Eventually, the system disintegrated as emerging nation-states provided effective inter-community transaction institutions. The Grameen Bank experience would not be effective in urban areas with weak personal ties among residents. The chaebol system has served useful functions in Korea's drive for growth. However, the system is now considered an obstacle to Korea's further economic development, which depends on whether Korea develops sound economy-wide institutions that promote low-cost transactions.³²

4.3 Lessons for promoting growth and poverty reduction in developing countries

Potential entrepreneurs and workers in developing countries suffer from not only limited skills but also inadequate access to banks, product and input markets, and employment opportunities. Consider the following common cases:

- A small farmer needs to buy some equipment but has to pay for it in cash, which may not be available until his next crop is harvested and sold.

- A skilled village artisan is unable to borrow money from a local bank to open a small shop because she does not have collateral.
- A shopkeeper in a small town wants to hire a part-time helper. Although several qualified candidates are available, she does not have any assurance that the candidates are trustworthy. As an insurance against employee misconduct on jobs dealing with cash or merchandise, some employers demand “collateral” from impoverished jobseekers. The virtual impossibility for jobseekers to satisfy this requirement is likely to result in failure of an employment contract to materialize.

Transaction institutions are not effective in emerging market economies even in modern sectors. (i) Their banking systems are weak, often with large non-performing loans. Capital markets are not well developed. Small and medium enterprises tend to experience severe obstacles in securing financing. (ii) Most developing countries face the need to reform corporate governance.

In these examples, ineffective transaction institutions are critical constraints on growth and poverty reduction. More generally, producers can rarely expand production and employment without engaging in exchange separated over time and space between the quid and the quo. Such expansion, however, inevitably gives rise to an increase in the need to extend or access credit.³³

Building transaction institutions as a repeated game

Grameen Bank experiences indicate for developing countries an approach to helping the poor establish access to credits, markets, inputs and job opportunities in the absence of efficient transaction institutions. Game theory suggests that governments’ policies should focus on providing an institutional framework for producers, borrowers and jobseekers to form small voluntary groups such as cooperatives. This framework should be aimed at (a) building a system of transactions as a repeated game and (b) promoting a system in which players (for example, cooperatives, their present and potential creditors, or employees and employers) have easy access to information on the overall performance of cooperatives, though not necessarily of their individual members.

The cooperatives, or cooperative-like groups, would not necessarily have a formal internal governance structure; their internal governance would be based on personal ties for cooperation, competition and mutual sanctions. The size of a group, therefore, should be small and transactions should build up gradually.³⁴

- The financial institutions should gradually increase the amounts of loans.
- Producers (for example, smallholders) should be able to increase their access to financial institutions or to product or input markets by

forming voluntary groups (for example, credit cooperatives), each comprising a small number of producers who are collectively liable for the credits extended to them.

- The members of cooperatives would be able to maintain their respective groups' credit standings through mutual sanctions based on personal ties.
- These schemes, although not so easy in urban areas, would be applicable to small shopkeepers and independent entrepreneurs.
- Employees' or jobseekers' small voluntary cooperatives or cooperative-like organizations, based on personal ties, could help poor workers secure jobs.

Using business groups for large-scale investments

Without the benefits of efficient institutions for intercommunity transactions, chaebol groups in Korea mobilized financial resources for large-scale investment projects by relying on informal arrangements that have proven useful throughout history. Other developing countries may have no choice but to use a similar system for large-scale investments. Yet the chaebol system is considered to have been, and to continue to be, inefficient. Moreover, directed lending and other interventionist policies that supported the chaebol system are becoming increasingly unviable under World Trade Organization rules. An effort to use a similar system should be complemented by an incentive system to minimize its inefficiency.

5 Issues for building public institutions

Formal institutions in many developing countries should be designed with an adequate recognition of how they will interact with informal norms, many of which have their roots in collective values. To this end, it is not enough to take into account human nature, which is universal. It is necessary to consider the dimensions of the culture of the country in which the formal institutions are to operate. Institutional challenges are twofold:

1. How do governments (or countries) design and adopt efficient rules?
2. How do they enforce the rules?

The remainder of this section addresses these questions in reverse order, focusing on several issues that need to be considered when building formal institutions in economies with a collectivist culture. Some of these issues do not emerge in economies with an individualist culture. The section's limited objectives are to highlight issues and to offer historical examples, not to offer a blueprint for reform.³⁵

5.1 Rule-making versus rule-implementing, collectivism and factionalism

A government demonstrates a commitment to rules by enforcing the rules consistently and in a non-discretionary manner. More realistically, it subjects itself to “a set of rules that do not permit leeway for violating commitments” (North and Weingast, 1989: 804). Based on this latter approach, an effective government uses at least two principles: (a) separation of powers and (b) checks and balances. A system of checks and balances forces the legislative, executive and judicial branches to be interdependent.³⁶ This system separates law-making functions from law-implementing functions. If laws were the only rules, this system would also help separate rule-making functions from rule-implementing functions. This formal system operates well when nested in individualism.

5.2 Checks and balances in a collectivist culture

In a collectivist culture, however, this system may not operate as intended for a number of reasons. First, a large threat to non-discretionary rule implementation often comes not only from the political party in power but also from other social groups, to whom members of different government branches have excessive loyalty arising more from party membership, regional or tribal affiliation or school ties than from their official duties.³⁷ This loyalty weakens the intended checks and balances in the separation-of-powers principle. Secondly, rule implementation is undermined by the fact that the functions of the executive branch often encompass both rule-making and rule-implementing. Finance ministries not only formulate rules (for example, tax policy, budget and regulatory measures) but also often implement them, although, in a formal sense, the real authority for their legislation belongs to the legislative branch. Without either a strong tradition of a rule of law or a transparent system of public monitoring of rule implementation, reasonably efficient rules that have been formulated with public scrutiny may be implemented through a series of non-transparent discretionary actions. The results are discrepancies between de jure and de facto tax, regulatory and other regimes of economic rules. How do culturally collectivist societies build a tradition of non-discretionary rule implementation?

5.3 Issues in institutional reform for non-discretionary rule implementation

To ensure non-discretionary rule implementation, the relationship between rule-implementing agencies and their rule-making counter-

parts may have to be redefined. Several issues should be considered here.

Separating rule-making and rule-implementing functions

Clearly, it would not be easy to separate all rule-making and rule-implementing functions into two mutually exclusive groups. It seems feasible, however, to isolate a set of critical rule-implementing functions. Here are only a few examples:

- The functions of government prosecutors, mandated with law enforcement, can be separated not only from law-making but also from law enforcement policy formulation.
- Tax administration can be separated from tax policy formulation and legislation.
- The agencies that implement regulatory measures (for example, anti-trust, banking supervision) can be separated from those that formulate these measures and send them to the legislative branch.
- Budget execution can be separated from budget formulation. A rule-making agency should cooperate with the rule-implementing agency; it does not appear to be essential, however, for them to be part of the same agency.

Ensuring checks and balances

If the principle of separation of powers is applied to making and implementing rules defined to encompass laws, policies and regulations, there is a case for institutionally separating the two types of functions – as the legislative and the executive branches are separated. In a society with a collectivist culture and a large power distance index, prosecutors may be unduly loyal to those who appoint them. This possibility may be reduced by making law enforcement offices autonomous from elected law-making officials but subject to strict performance standards and checks and balances aimed at limiting the opportunities to abuse their authority.³⁸ Autonomous agencies would have a greater chance of resisting the political pressure to use discretion in their administration of a regulatory, tax or budget policy regime.

The separation of rule-making from rule-implementing has received attention both in countries with an individualist culture and in those with a collectivist culture. Many countries have an independent civil service. For example, the United States introduced the Civil Service Commission, now the Office of Personnel Management, in 1883 to replace the “spoils system” with a “merit system”.

New Zealand’s public expenditure management system is based on separating the role of ministers, who are responsible for policy-making, from the role of departmental chief executives, who are in charge of

policy implementation (Scott, 1996; Lee, 1995). This system might not work well in a collectivist culture, in which rule makers are likely to be a source of discretionary rule implementation.³⁹ The basic approach, however, with some modifications, can be considered for developing countries.

In the new programme budget system in Brazil, a culturally collectivist country, a programme manager, who is in charge of implementing a budgeted programme, does not report to the line ministers who control the budgetary resources that are used as inputs for the programme. This system adds a layer of checks and balances in the process of budget execution, in addition to the one provided by parliamentary oversight.

A number of developed and developing countries have foreign nationals as heads of key policy-implementing agencies (for example, tax collection agency, central bank). Others have used foreign commercial firms for certain aspects of customs administration (for example, pre-shipment inspections). To an extent, these are aimed at enhancing *non-discretionary* implementation of rules (tax laws, monetary policy rule, customs laws) by mandating those without ties to domestic interest groups to implement rules.

Individualist societies try to ensure the political neutrality of some rule-implementing agencies (for instance, an independent judiciary and an autonomous tax collection agency).⁴⁰ Culturally collectivist societies require a more rigorous system of autonomy for rule-implementing agencies in areas for which such agencies are not required in individualist societies.

Making local rule implementation non-discretionary

In a collectivist culture, local government operations may be easily influenced by local interest groups with personal ties to local government officials.⁴¹ Although local political processes ought to dictate policy formulation, should local policy implementation in key areas be assigned to professional administrators independent of local political interests and without personal ties to interest groups, as in the case of central tax administration agencies in some countries that collect *local* taxes on behalf of local governments? These are important issues to consider in designing a system of non-discretionary local rule implementation.

Holding autonomous rule-implementing agencies accountable

It is not easy to determine the degree to which autonomous rule-implementing agencies should be independent. Should they be independent of ministers, of the prime minister or of the president? Different

countries will have different circumstances. A question is whether the possibility of their abuse of authority is more tolerable than elected officials' abuse of rule-implementing agencies' loyalty for their own political gains.

5.4 Making new rules to tame factionalism: Three historical episodes

Whereas rule implementation should be politically neutral, rule-making should be an outcome of political competition, which should be governed by efficient rules. Through history, building political institutions has challenged all societies.⁴² In the stories discussed below, stable frameworks for political competition have emerged from the interplay of not only vested interests but also ideas of both groups and individuals, including institutional entrepreneurs: Cleisthenes in ancient Athens, James Madison in Colonial America and Lee Kuan Yew in Singapore. New political institutions have effectively helped a society tame factionalism.⁴³ These stories represent historical episodes that this section presents to highlight one particular aspect of rule-making: the successful establishment of institutions for productive political competition in which rival political groups are induced to seek societal, rather than factional, interests. The section does not assess or judge the institutions in their entirety. None of them was free of problems, criticisms or controversies. For example, the constitutions of ancient Athens and Colonial America did not resolve the problem of slavery. Lee's emphasis more on order than on freedom has caused controversies.⁴⁴

Cleisthenes' constitution for ancient Athens

In 682 BC, Athens abandoned monarchy and adopted a government of elected officials (*archons*), but had serious economic, social and political problems – most of all, strife among tribes, between low-income groups and wealthy aristocrats, and among regions.⁴⁵ In 510 BC, Athens turned to Cleisthenes, the head of a prominent family, to lead a constitutional reform effort. Cleisthenes designed and implemented a constitution that dismantled traditional tribes with parochial interests and replaced them, for the purpose of political competition, with new artificial tribes (*phylae*) designed to represent broad societal interests.⁴⁶ The reform “transformed Attica from a country of squabbling ... geographic and economic interests ... preoccupied with zero-sum redistribution into the world's first democracy” (Mueller, 2001: 75). When accepted, the 500 councillors took the oath “to advise what is best for the state” (Hammond, 1986: 190). The several decades following the reform include the Athenian Golden Age.

James Madison and the US Constitution

Following the Declaration of Independence, the 13 American colonies clashed over regional and sectoral interests. Madison's role was critical in framing the US Constitution, including the crucial Bill of Rights. A guiding principle was to protect the constitutional process from factional influences. North stresses this aspect: "Thus Madison, in Federalist Paper Number 10, maintained that the constitutional structure was devised in 1787 not only to facilitate certain kinds of exchange, but also to raise the costs of those kinds of exchange that promote the interests of factions" (North, 1990: 47). As earlier pointed out, Madison's emphasis on rules, rather than the wisdom of leaders, should be noted.

Lee Kuan Yew and housing and electoral reforms in Singapore

When Singapore became an independent country, few believed in its viability as a country (Lee, 2000). Singapore is a culturally collectivist country, where Chinese, Malay, Indian, and other smaller ethnic groups comprise a diverse population. Racial strife was not uncommon. Establishing a rule-based economic system without abandoning a collectivist culture has been notable. Under Lee's leadership, the government actively pursued policies, formalized in a government white paper, to help Singaporeans put the interests of the nation above those of ethnic groups. At the same time, the government promoted the establishment of ethnically integrated neighbourhoods by using a system of quotas in distributing apartment units. To ensure that minority groups from ethnically integrated electoral districts are represented in the parliament, the government instituted a system of group representation constituencies (GRCs), which were created by amalgamating three or four single-member constituencies and then contested by candidate groups, each with three or four members. Each group of candidates had to include a minority candidate to receive the support of minority voters.

5.5 The role of institutional entrepreneurs and values

The role of institutional entrepreneurs

The three examples highlight the importance of ensuring that political competition promotes the interests of the society as a whole, rather than the interests of groups, factions, regions or sectors. To this end, the three countries adopted formal rules: a new constitution in ancient Athens and Colonial America and a new election law in Singapore.

In all three countries, institutional entrepreneurs played key roles. How did these institutional entrepreneurs emerge? It appears that, in all

three countries, political and social conditions allowed open, although not unlimited, competition. There was a relatively level playing field for competitors. In ancient Athens, some 80 years prior to the Cleisthenes constitution, Solon's reform had established, in what Aristotle called a mixed oligarchic-democratic system, an equality of political rights among all Athenians in the election of officials (Hammond, 1986: 162, 190).⁴⁷ The American colonies also had a level playing field for political competition. Most of the founding fathers in America had the best formal education locally available, but they were not "like anything that existed in ... Europe".⁴⁸ Singapore has become a merit-based society.⁴⁹

The role of values

Values also played a role. In a culturally collective Singapore, the government has intervened with paternalistic policy measures (for example, a residential quota system aimed at racial integration, electoral reform featuring GRCs and a government white paper stressing the value of national cohesion). In the West, the functioning of formal institutions has been reinforced by political values that have sought the will of the majority, while resisting "the tyranny of the majority" (Mill, 1859; quoted in Himmelfarb, 1982). These values have guided many politicians who "on behalf of principle and to defend the overall interest of the country, confronted the passion of ... a majority of the general public" (Nevins, 1956: xi).⁵⁰

5.6 Issues in rule-making

Although developing countries with collectivist values face a difficult challenge in establishing political institutions that can tame factionalism, the three examples of political reform, together with the findings of new institutional economics, suggest several issues for political reform.

How can political groups be formed to represent societal, not factional, interests?

The Cleisthenes reform institutionally ensured this outcome by forming artificial tribes. The US Constitution balanced the interests of the union and those of states by instituting, among other means, a Senate where small and large states are represented with equal votes. Madison (1787) drew the attention of the public to the harmful effects of factions (for example, "a landed interest, a manufacturing interest, a mercantile interest, a moneyed interest"). Singapore's governmental white paper stresses the importance of the national interests over factional interests. Its electoral reform protected the political rights of the ethnic minority groups by instituting GRCs.

Game theory suggests the following conditions:

- Competing political groups (for instance, political parties) and their members should be not only interested in long-term political payoffs but also able to define the future streams of their respective political payoffs.
- They should have a well-defined, enduring policy agenda – an identity or a label. A collectivist culture and a large power distance can be an obstacle to their establishing such an agenda. Between one election and the next, politicians may reorganize political groups and blur their political identities, making it difficult for political competition to be established as a repeated game.
- The number of competing political groups should be limited. Public choice theory offers some useful suggestions to this end. As Singapore's electoral reform has demonstrated, the design of an electoral system can influence the nature of political competition. For example, the number of competing political groups tends to be determined by "district magnitude", the threshold of representation, the threshold of exclusion and the definition of majority in the determination of election outcomes.⁵¹

How would political groups agree on the reform of rule implementation?

Clearly, rival political groups will not agree to adopt the system of rule implementation outlined in section 5.3 above unless they believe that the system will benefit them – if not now, over time. Conditions should be created for each competing political group to recognize that the discounted present value of the future course of its political payoffs is greater in the new regime than in all counterfactual regimes, including the status quo. A challenge is to identify and create these conditions.

How do countries establish a level playing field for political competition?

The soundness of political competition depends on the soundness of not only intergroup competition but also intragroup competition. In many Western countries, a key question now in this regard is campaign financing. In a collectivist culture, this is much more than a campaign financing issue: a high power distance index and the overwhelming advantage of established politicians can be an effective barrier to new politicians' entry into political markets. A simple term limit might not be an answer if it excluded incumbent, but best, candidates from competition.

6 Promoting efficient economic and political transactions

6.1 Transactions as non-cooperative games in a society with weak rules

Economic and political transactions either do not take place or break down because the three conditions mentioned in section 2.2 for successful non-cooperative games are difficult to establish. When such games take place, they often do so essentially as a series of suboptimal non-cooperative one-off games.⁵²

Standard game-theoretic analyses assume (among other conditions) individualism – a condition that does not exist in many developing countries. Are the results of such analyses relevant for culturally collectivist developing countries? They are definitively relevant for the games played by economic and other interest groups (for example, among groups of borrowers and lenders, rival political groups) in developing countries. What do game-theoretic analyses suggest for promoting repeated economic and political transactions?

6.2 Promoting cooperative dimensions in non-cooperative games

Axelrod's suggestions (1984: chap. 7) provide a helpful guide for a reforming government. The ideas in this section are based on his suggestions.

Make the future count

In Axelrod's terminology, this is "enlarging the shadow of the future". A reforming government can take two practical steps: making interactions durable and making them frequent. The Grameen Bank's microcredit programme has these elements. Promises of rewards, provided in addition to threats of punishments, make productive interactions durable.

Set payoffs appropriately

The penalties for the violators of rules should be sufficiently large. Many banks impose severe punishments (for instance, cutting off credit lines, demanding an unusually high interest rate) for delayed loan repayments. The government in many well-functioning economies imposes credible penalties for the violation of tax and other laws. The government in poor countries often has an ineffective tax system that offers real benefits to late payments.

Make the players' past records in effect available to all players

Axelrod suggests improving "the ability [of players] to recognise the other players from past interactions, and to remember the relevant

features of those interactions” (1984: 139). More broadly, the government can help disseminate such information. For example, the government can promote private organizations that would make borrowing groups’ credit histories in effect available to all microcredit suppliers. The transaction system’s focus on groups, as suggested in this chapter, rather than on individuals, would be less taxing for developing countries with limited administrative resources.

7 Summary and conclusions

Economic prosperity in the Western developed countries is a result of sustained economic growth, which has been based in part on their efficient institutions, or rules, encompassing, among other things, an efficient transaction system supported by an effective judicial and political system. Certain dimensions of culture, such as individualism–collectivism, power distance and uncertainty avoidance, affect the efficiency of rules. In particular, individualism has been a critical factor helping a country to establish and maintain rule-based transactions. Cultural collectivism in most developing countries tends to promote the use of discretion and to undermine rules.

History provides developing countries with important lessons for promoting growth and reducing poverty. Before they reach the final stage of institutional development, in which efficient third-party enforcement supports widespread transactions, they can benefit from arrangements that have promoted intercommunity transactions without strong intercommunity transaction institutions. The experiences of the community responsibility system, the Grameen Bank and the Korean chaebol system suggest useful interim steps toward establishing transaction institutions for economic growth. The lessons should guide efforts to develop microcredit programmes, to increase small farmers’ access to product and input markets, to provide the unemployed poor with job opportunities and to enable large enterprises to mobilize capital in the absence of sound financial institutions. It is important to note, however, that these arrangements have critical weaknesses and eventually must be replaced with more efficient institutions.

In building efficient public institutions in a collectivist culture, it may be useful to make a clear distinction between rule-making and rule-implementing and to identify groups of important rule-implementing functions of government. Examples include law enforcement, tax administration and budget execution. To promote non-discretionary rule implementation, developing countries may consider mandating only some

organizations with these rule-implementing roles and making them autonomous from interest groups and even from elected government officials. Of course, these organizations must be held accountable to the public via strict and transparent performance requirements. They should have well-defined and accountable selection and removal procedures for their officers.

Legislation, policy formulation and other rule-making must be an outcome of a political process, which can be considered a process of games. Political reform in a collectivist culture should be aimed at taming factionalism and at promoting the interests of the whole society, rather than of factions, sectors or regions. The assumptions of individualism and rationalism underlying game-theoretic analysis extend realistically to games among competing groups in a culturally collectivist society. Therefore, the conclusions of game-theoretic analysis can provide a useful guide for institutional reforms in a collectivist society, which should aim its reform efforts at lowering barriers of entry for competitors into political markets. Political reform should be designed to provide a framework within which competing political groups can play a repeated game as a learning experience. To this end, the examples of ancient Athens, Colonial America and contemporary Singapore provide good lessons. If building institutions is a game and a learning process, it is important to pay attention not only to what institutions are to be built but also to how to build them.

The Grameen Bank experience offers interesting pointers. The Grameen Bank started to lend small amounts and gradually increased the amounts as borrowers accumulated credit rating. The Grameen Bank and its borrowers played a repeated learning and lending–borrowing game. The collective punishment scheme was nested in the collectivist culture of Bangladesh society.

The particular values discussed in this chapter are only a part of the systems of values guiding human behaviour in different societies. The chapter has not judged these values, but has offered an analysis of the economic implications of these values. Economists and other social scientists should more explicitly integrate these implications into their analyses of economic growth and poverty reduction. Rule-making should also take them into account.

Appendix

Table 1A.1 Country groups by individualism–collectivism (IC) and power distance (PD) indices

	Large PD	Moderate PD	Small PD
<i>Individualist</i>		Australia (90, 51)	United States (91, 40) United Kingdom (89, 35) Canada (80, 39) Netherlands (80, 38) New Zealand (79, 22) Denmark (74, 16) Sweden (71, 31) Ireland (70, 28) Norway (69, 31) Switzerland (68, 34) Germany (67, 35) Finland (63, 33) Austria (55, 11) Israel (54, 13)
	Belgium (75, 65) France (71, 68)	Italy (76, 50) South Africa (65, 49) Spain (51, 57)	
<i>Collectivist</i>	India (48, 77) Brazil (38, 69) Turkey (37, 66) Greece (35, 60) Philippines (32, 94) Mexico (30, 81) Portugal (27, 104) Malaysia (26, 104) Hong Kong (25, 68) Chile (23, 63) Singapore (20, 74) Thailand (20, 64) Korea (18, 60) Taiwan (17, 58) Peru (16, 64) Indonesia (14, 78) Colombia (13, 67) Venezuela (12, 81)	Japan (46, 54) Argentina (46, 49)	Costa Rica (15, 35)

Source: Hofstede (1997).

Note: The first figure in parentheses indicates the IC index; the second the PD index. A high IC index indicates a high degree of individualism.

Table 1A.2 Country groups by individualism–collectivism (IC) and uncertainty avoidance (UA) indices

	Strong UA	Moderate UA	Weak UA
<i>Individualist</i>		United States (91, 46) Australia (90, 51) Canada (80, 48) Netherlands (80, 53) New Zealand (79, 49)	United Kingdom (89, 35) Denmark (74, 23) Sweden (71, 29) Ireland (70, 35)
	Italy (76, 75) Belgium (75, 94) France (71, 86) Germany (67, 65)	Norway (69, 50) Switzerland (68, 58) South Africa (65, 49) Finland (63, 59)	
<i>Collectivist</i>	Austria (55, 70) Israel (54, 81) Spain (51, 86) Japan (46, 92) Argentina (46, 86) Brazil (38, 76)		Philippines (32, 44)
	Turkey (37, 85) Greece (35, 112) Mexico (30, 82) Portugal (27, 104) Chile (23, 86) Thailand (20, 64) El Salvador (19, 94) Korea (18, 85) Taiwan PC (17, 69) Peru (16, 87) Costa Rica (15, 86) Colombia (13, 80) Venezuela (12, 76)		Malaysia (26, 36) Hong Kong (25, 29) Singapore (20, 8) Indonesia (14, 48)

Source: Hofstede (1997).

Note: The first figure in parentheses indicates the IC index; the second the UA index.

Notes

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1. A “community” is a group of individuals with personal or other ties (e.g. kinship, friendship, or acquaintanceship). A community may be large (e.g. a town) or small (e.g. families).
2. Historically, traders often relied on private third-party enforcement mechanisms (e.g. law merchants, or *lex mercatoria*). But law merchants were not an adequate substitute for coercive governmental enforcement (see Aoki, 2001).
3. See Romp (1997) for a discussion of cooperative and *non*-cooperative games. In the context of banking, Greif (1997) has stated these conditions more formally: a game of exchange is possible if (a) it is repeated infinitely, (b) borrowers have a “label” known to all the lenders, and (c) each player’s past actions are known to all.
4. See Ray (1998: chap. 8) for a discussion of the failure of credit, insurance and labour markets for the poor in developing countries. Note how, for example, a shopkeeper and a jobseeker with inadequate nutrition, in a situation of a game of Prisoner’s Dilemma, may fail to agree on mutually beneficial long employment because of the absence of proper institutions. Quite often the analysis of poverty focuses on what is happening (e.g. the effect of malnutrition) but not on what could happen (e.g. the potential effect of institutions that would help the poor worker secure a job and build up his or her nutrition).
5. Hofstede’s work in the 1980s, building on the work of anthropologists, sociologists and psychologists, has given rise to extensive research in cross-cultural psychology (see Berry et al., 1992).
6. Individuals are members of overlapping groups. Heyer, Stewart and Thorp (1999) note the importance of group behaviour for development, focusing on the implications of *intragroup* operational modes: power/control (P/C), quasi market (M), and cooperation (CO-OP). P/C is associated with a large power distance, M with individualism and CO-OP with collectivism, although Western values (e.g. golden rule, categorical imperative) are not incompatible with the CO-OP mode of operation. These three modes are in line with those (despotic, super-trader and glued-together) associated with Sen’s suggested approaches to analysing the operation of families – the most basic of all groups (Sen, 1983).
7. The term “collectivism” indicates a group-oriented value system and refers in this chapter to a cultural phenomenon, not to a system of collectivized production. Rand (1943) has used the terms “collectivism” and “individualism” similarly.
8. Examples of questions for measuring individualism–collectivism (IC) indicators for individuals include the following: (i) “If the group is slowing me down, it is better to leave it and work alone” (individualism); (ii) “I enjoy meeting and talking to my neighbours every day” (collectivism); (iii) “It is reasonable for a son to continue his father’s business” (collectivism) (Berry et al., 1992; Triandis et al., 1986, 1988; Hui, 1988).
9. The indices are national tendencies, around which individual indices are distributed. Hofstede (1997, 2001: 86) bases his measures on mean scores of sample individuals and percentages of certain responses. Others (e.g. Triandis et al., 1986, 1988; and Hui, 1988) have developed individual-level scales to place persons on the collectivism–individualism dimension. Note that the discussion is on behavioural norms; actual behavioural patterns deviate from these norms.
10. Cultural collectivism is widespread. For example, see the definition of shared values in a

Government of Singapore white paper, quoted in Huntington (1996: 319): “Nation before [ethnic] community and society above self ... Consensus instead of contention”; and Etounga-Manguelle (2000: 71): “If we had to cite a single characteristic of the African culture, the subordination of the individual by the community would surely be the reference point”.

11. Individualism is deeply ingrained in Western thought. See Rawls (1990: 24–25): “Each member of society is thought to have an inviolability founded on justice ... which even the welfare of every one else cannot override”; and Rand (1943: 678): “His truth was his only motive. His own truth, and his own work to achieve it in his own way.” Economics has based its analysis on self-interested economic agents. Drawing on evolutionary biology, some researchers in evolutionary economics, however, note the role of biological and cultural “relatedness” among gene-sharing (e.g. kins) and other members of a society (Hirshleifer, 1999).
12. See tables 1A.1 and 1A.2 in the appendix to this chapter. Table 1A.1 classifies the sample countries by their IC, PD and UA indices. Belgium and France are the only Western, developed countries with large PD indices. Costa Rica is the only country in the rest of the world with both a collectivist culture and a small PD index.
13. The Chinese phrase “eating from one pot” characterizes economic, social and political interactions in Sinic and other civilizations with a collectivist culture. See Ensminger (1997) for a discussion of the factors arising from social norms that underlie the failure of land titling in Kenya.
14. Paternalistic attitudes do not necessarily belong only to government. Postbellum southern plantation owners in the United States relied on paternalistic labour relations to sustain non-mechanized agriculture (Alston and Ferrie, 1996).
15. Focusing on long-term issues, this chapter characterizes the Korean government’s policies during the past 30–40 years. The Korean government has been pursuing a range of economic reforms, and some of the policies described in this chapter have been abandoned or modified. The slowness with which values change, however, can frustrate a government’s reform efforts.
16. Confucianism formalizes a group-oriented social and political order dominated by wise, paternalistic leaders. Thus, Confucius’ ideals stress personal cultivation as the basis of a world order: “Confucianism traced back the ordering of a national life to the regulation of the family life and the regulation of the family life to the cultivation of the personal life” (Lin, 1938: 21). Note that these are ideals, not necessarily realities. It appears that Confucian societies, and culturally collectivist societies more broadly, continue to stress unduly the importance of the roles of wise leaders; this is in contrast to the tradition of scepticism about such roles in the Western world. For example, Madison (1787), in a strong rejection of discretion, stated: “It is in vain to say that enlightened statesmen will be able to adjust these clashing interests, and render them all subservient to the public goods. Enlightened statesmen will not always be at the helm.”
17. The strength of group loyalty would tend to aggravate the conflicts of different groups’ interests. Stewart (2001) has pointed out the possibility that horizontal inequalities – inequalities among cultural groups in a society – may be a source of development disasters.
18. By comparison with the large difference between the rule of law and tax compliance indices for the two country groups, the difference between the regulatory efficiency indices is not large. Note, however, that Western countries tend to have an elaborate regulatory regime aimed at achieving product safety, antitrust, environmental protection and other public policy objectives. Moreover, they have a high statutory tax burden, which tends to encourage tax evasion. Considering these circumstances, the difference in the tax compliance indices between the two country groups is considerable.

19. The estimation results are robust. Using each of the three components (for judiciary independence, soundness of property rights and independence of the legal framework) as the dependent variable, rather than the composite rule-of-law index, still gives strong statistical results.
20. Results, not reported in this chapter, show that regressions conducted on a subsample of 21 culturally collectivist countries (i.e. countries with an IC index of less than 50) are not qualitatively different.
21. Greif (1994) also indicates that individualism characterized the social norms of medieval Genoa.
22. See also Morishima (1988) for a discussion of how Japanese are good competing in groups but not as individuals.
23. Psychologists often distinguish between enculturation (cultural diffusion between generations within a culture) and acculturation (cultural diffusion between cultures). Acculturation is a slow process (Berry et al., 1992). New rules change human behaviour through compliance, identification and internalization. Cultural diffusion would not be complete, however, without internalization (Lieberman, 1963).
24. Li (2000) distinguishes between “relation-based governance” and “rule-based governance”. Moving from the former to the latter is a long tortuous process.
25. See Hamdok (2001: i) for a discussion of how “the recent emphasis on governance in Africa is unique in that it was initiated by donors and not by domestic leaders under pressure from their own constituencies”. Aoki (2001) contrasts the view of institutions as a “spontaneous order”, as discussed by Hayek (1988), with the view of institutions as artificially designed. The transplanted formal institutions in developing countries often have the characteristics of the latter.
26. In some transition economies, networks, clans and other informal groups play a range of roles, which include appropriating the state and, in some cases, forming a “clan state” (Wedel, 2001). These groups differ in nature from tribal or regional groups that give rise to civil war and other conflict (Addison, 2001), but are more likely to emerge in culturally collectivist than in individualist countries. Barr (2000) discusses Ghanaian entrepreneurial networks, which are largely bilateral.
27. See also Greif (1994), who associates collective punishments more generally with a collectivist culture. Greif’s analysis also shows that some medieval communities were collectivist whereas others were relatively individualist in their cultural orientation, and that the collectivist transaction institutions are more efficient in supporting intra-community transactions – requiring less costly formal institutions – but less efficient for intercommunity transactions (Greif, 1994: 942).
28. Yunus (1999: 93) stresses the importance of “the power of peers. . . . If one member fails to repay a loan, all members risk having their line of credits suspended or reduced.” Borrowers are required to join the bank in self-formed, five-member groups. “A new group submits loan proposals from two members, each requiring between \$25 and \$100.” The Bank used threats of collective punishments, but these have rarely been carried out (see Dowla, 2000).
29. See Amsden (1989: 184–188) for a discussion of the close and exclusive ties between the Hyundai Motor Company and some of its legally separate subcontractors.
30. Since the 1977–1978 financial crisis, the chaebol system has been undergoing changes, partly as a result of the Korean government’s effort to reform banking and corporate financing and governance.
31. For the firms in a chaebol group, weak transaction institutions in Korea elevate the costs of market transactions relative to the costs of internal governance. See Williamson (1985) for a discussion of the efficiency of hierarchical transactions relative to market transactions in driving vertical integration, and of the relationship between the costs of

internal governance and market transactions. As Hart states, “ownership is a source of power when contracts are incomplete” (1995: 29). Firms acquire other firms partly because the power will enable them to internalize transactions.

32. It is not strictly correct to characterize the CRS, Grameen Bank and chaebol–bank relations equally as responses to a failure in intercommunity transaction institutions. The CRS functioned with no intercommunity institutions. The successful loan management record of the Grameen Bank has been attributed more to its policy of requiring borrowers to be jointly liable than to an effective legal system. The chaebol–bank relationship is subject to a multitude of laws in Korea; however, there is an agreement that commercial banking requires reform, which is now a key challenge facing Korea.
33. The only type of transactions that would not require contracts or transaction institutions would be spot transactions for a good whose quality is known. Weak transaction institutions would limit even spot trade if the transacted goods are of unknown quality.
34. These groups would have only one function: cross-guaranteeing among one another for their intergroup transactions. Chaebol-like larger groups would have a range of functions, as is the case with many groups that emerge in developing countries. See Agarwal (2000) for a discussion of some of them.
35. In this section, rules refer to formal rules, unless otherwise indicated. It is worth noting, however, that rules have a hierarchy. Buchanan (1987) makes a distinction between the constitution of economic policy and economic policy. The former provides basic rules (e.g. a constitution, central bank law, budget law) for making specific rules (e.g. monetary policy, fiscal policy). Buchanan refers to the former as rules, but not the latter.
36. The English idea emphasizes impartial administration of laws through the separation of powers between law-making and law-implementing, whereas the American idea emphasizes checks and balances, particularly constraints imposed on law-making by the judiciary (see La Porta et al., 2001). This section stresses (a) the similarities among Western rules of law and (b) the discrepancy between *de facto* and *de jure* legal institutions in poor countries.
37. Public choice theory suggests that an independent civil service can make it difficult for an elected government to pursue promised policies (see, for example, Tullock, 1987). In countries with a collectivist culture, however, bureaucrats’ excessive loyalty to elected politicians can be a source of discretion in rule implementation.
38. In the United States, federal judges are appointed for a lifetime tenure and cannot be removed from office without an impeachment and conviction. In culturally collectivist countries, judicial independence might not be sufficient for efficient law enforcement.
39. See Bale and Dale (1998) for the demanding conditions that must be satisfied for a successful New Zealand-type reform: a consistent, comprehensive conceptual model; a clear performance definition; and a focus on what government does best. Schick (1998) suggests that a successful New Zealand-type reform should follow basic reforms to strengthen rule-based government.
40. The regulatory agencies in the United States are intended to be independent of the political goals of a particular president, and the heads of many regulatory agencies cannot be removed from office by the president unless for breaking the law. The data on legal institutions reported in La Porta et al. (2001) indicate that many developing countries, which may not have a firmly established rule of law, have a legal system based on the lifelong tenure of supreme court justices, suggesting that lifelong tenure of law-implementing officials may not be a sufficient condition for a rule of law.
41. This system would be in line with the Grameen Bank’s policy to rotate loan officers throughout the country regularly to prevent them from developing personal ties with local borrowers.

42. See North (1998) for a discussion of how competition among, as well as within, evolving nation-states determined the features of economic development. Competition among states forced some of the crowns to trade rights and privileges. See also North and Thomas (1973).
43. In this chapter, “societal” interests are used to indicate the broader interests of society, compared with the interests of individuals or individual groups. Although individuals and groups may not agree on a social welfare function, a distinction is often made between private and public interests, as well as between individual and social rates of return.
44. Kissinger, in his foreword to Lee’s volume, notes Lee’s “analysis of the difference between the individualism of the west and the priority for social cohesion in countries such as his and in much of the rest of Asia” and the criticism that Lee’s view based on this analysis has aroused in the West. Lee stresses fundamental differences between East Asian and Western societies, the former believing that “the individual exists in the context of the family, extended family, friends, and wider society . . . These values make for a productive people and help economic growth” (2000: 491). Sen (1997: 34) argues that the “Lee hypothesis” is based on limited information: “Systematic empirical studies give no real support to the claim that there is a general conflict between political rights and economic performances.”
45. This summary is largely based on Mueller (2001) and Hammond (1986).
46. For details, see the longer version of this chapter (WIDER Discussion Paper 2001/98).
47. Greek historians have described the openness of political competition in ancient Athens around that century. For example, Book II of Thucydides includes “The Funeral Oration of Pericles”, which, delivered about 80 years after the Cleisthenes’ reform, includes the following passage: “If we look to the laws, they afford equal justice to all in their private differences . . . if a man is able to serve the state, he is not hindered by the obscurity of his condition” (see Finley, 1959: 267).
48. “All of its members, not just those like Benjamin Franklin and Alexander Hamilton with famously impoverished origins, would have languished in obscurity in England or France” (Ellis, 2000: 11).
49. Lee (2000: 59) describes the openness of competition in selecting the senior officials of the Economic Development Board.
50. Kennedy (1956) stresses the importance of US senators viewing issues from national perspectives. His volume includes accounts of American politicians (e.g. Daniel Webster, John Quincy Adams, Robert Taft) who, in pursuit of their conviction, risked their political careers by defying the popular will of their constituencies.
51. See Grofman and Reynolds (2001) for a review of the main findings.
52. Transactions in developing countries often have elements of the Prisoners’ Dilemma game. Outside their communities, buyers and sellers are reluctant to offer credits or employment contracts because they do not consider their relations will continue, although doing so would pay off to all players in the short run, as well as over time. Political parties often prefer a status quo rather than agreeing on reform legislation that would benefit the society over time.

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Institutional capital and poverty: A transition perspective

Syed Ahsan

1 Motivation

This study focuses on the interface between economic growth and “institutions”, à la new institutional economics (NIE), especially as these relate to poverty reduction. Here I conceive of institutions as the framework that facilitates economic and other exchanges, both within and outside of the market mechanism. In other words, I discern and evaluate the process by which economic growth leads to poverty alleviation, and attempt to identify the role of institutions in that process. Do institutions matter in determining the poverty performance of economic growth? Within this broad theme, I ask a further question, namely whether history (as specified by the concept of “path dependence” by Douglass North, 1990a) matters. In the transition context, the latter focus would relate to the evolution of institutions going into the command system following the Second World War.

The central focus of new institutional economics is that transactions are costly to execute.¹ Indeed, NIE makes a clear break from the Walrasian tradition by asserting that coordination of transactions is never as easily accomplished as is implied there. Matthews (1986: 905) conceives of institutions rather generally as a “set of rights and obligations affecting people in their economic lives”. To North, institutions are the “rules of the game”. Indeed, he goes further: “[I]nstitutions must not only provide

low-cost enforcement of property rights, bankruptcy laws, but also provide incentives to encourage decentralised decision making and effective competitive markets” (1997: 4). Among “formal rules”, he enumerates the polity, the judiciary and the laws of contract and property. These are complemented by what are generally referred to as “informal rules”. For North, the latter are “extensions, elaborations and qualifications of rules that ‘solve’ innumerable exchange problems not completely covered by formal rules. . . . Routines, customs, traditions, and culture are words I use to denote the persistence of informal constraints”. Williamson (1998: 77) defines the concept of “societal embeddedness” as “antecedent to the polity and refers to societal features (norms, customs, mores, religion) which differ among groups and nation states and operate as societal supports, or lack thereof, for credible contracting”. Indeed, von Hayek collectively described conventions “as part of cultural evolution of mankind” (1945; cited by Kaufer, 1984). The latter concept is generally known in current literature as social capital, advanced by Arrow (1970) and elaborated, among others, by Coleman (1988) and Collier (1998).

Further, I note that the somewhat diffused notion of governance mostly relates to institutions that a society must possess in order to monitor the “plays of the game”. Non-governmental organizations (NGOs) and civil society groups may be viewed as facilitating exchanges both in the *ex ante* sense and in the *ex post* (i.e. monitoring) role, acting directly or reinforcing the existing stock of social capital. Indeed, one of the theoretical advances of the chapter is the laying out of a unified framework where all these concepts will be seen to be capable of being arranged and explained in a hierarchical order, such that the components fit in as special cases (or subcategories) of more general ideas. The resulting construct serves as a general framework of “institutional capital” relevant for analysing the process of economic development and economic activities in general.

The transition perspective proposed here dwells on several broad themes. In practically all of the countries of Eastern Europe and the former Soviet Union (EEFSU), the continuing decline in output since the beginning of economic reforms following the overthrow of the command system has led to widening poverty. Ordinarily, one examines how countries with different growth rates (slow versus rapid) perform in their attempts at poverty alleviation (Ravallion, 2001). What we are faced with, in contrast, is largely a persistent decline in output since economic and political reforms began in 1989–1990. Thus it would be of interest to compare the poverty performance of negative growth with that experienced more widely. Secondly, the chapter explores how selected countries (all drawn from the EEFSU) differ in the design, delivery and

endowment of “institutions”.² I thus measure how the differences in “institutional capital” have affected the growth trend as well as the poverty profile of the countries in question. In particular, I attempt to test a hypothesis implicit in North’s thesis (1990a) that history matters; that is, the growth response to market reforms will depend on the legacy of formal as well as informal institutions inherited by the country in question prior to socialist rule.

Finally, I probe the interface between broader notions of poverty and institutional capital. Over the past two decades, researchers and policy makers have called for an expansion of the idea of poverty going beyond the income/expenditure dimension. The idea of “basic needs” popularized by World Bank scholars was a forerunner. A more vigorous effort started with the popularity of the idea of one’s capability being the relevant measure: poverty must be seen as the deprivation of basic capabilities rather than merely as lowness of incomes (Sen, 1999: 87). Here one attempts to measure how capable people are of enjoying the kind of life that they cherish (including basic freedom). Over the decade of the 1990s, this concept led to innovations by the United Nations Development Programme: it devised the human development index in 1993 and the human poverty index in 1997. Sen believes that this broadening of the concept enables one “to enhance the understanding of the nature and causes of poverty and deprivation by shifting attention away from the *means* ... to *ends* that people have reason to pursue, and, correspondingly, to the *freedoms* to be able to satisfy these ends” (1999: 90). In a practical context, one would select indicators to encompass critical aspects of mortality, nutrition, risk/vulnerability, lack of voice and political participation, and so on. Below I develop a simple measure of non-income poverty (NIP) along the above lines, and I analyse how the quality of institutions (vis-à-vis, say, the role of income growth) may affect the evolution of NIP.

The rest of the chapter proceeds as follows. In section 2, I provide a brief outline of the recent literature on growth and poverty and relate this to the transition context. I also probe the kind of testable hypotheses that one may derive from this review. Section 3 is devoted to an examination of the conceptual construction of institutional capital as an integral factor that allows economic (and other) exchanges to take place, thus alleviating market failure. I also explore the a priori role of differing levels of institutional capital in transition countries in explaining the observed difference in their performance over time and contemporaneously. In section 4, I discuss methodological issues of measurement, especially in light of data availability. Section 5 reviews the empirical findings, and section 6 concludes.

2 Growth, poverty and institutions

2.1 Measuring poverty

The literature on how to define and measure poverty is extensive. For poor countries, many agree with Sen (1976) that absolute poverty is what matters. Accepting this view leads to the idea that the expenditure (or income) required to maintain a socially minimal level of nourishment is a reasonable benchmark. This is the idea behind the notion of a “poverty line”, with all those who fall below the line being declared poor. This logic has led the World Bank to popularize the metric of a “dollar (or two) a day” per person as a rough and ready poverty line. Indeed, the acceptance of this measure of headcount poverty provides a foundation for the logic that economic growth matters.

The concept that a socially acceptable minimum nourishment will vary from location to location, and indeed over time and even within a country, is well understood. Consequently the necessary cost-of-living adjustment may easily be made for any given benchmark. Accounting for intra-household differences is another matter, however (see Kanbur, 2000). The present chapter focuses on the headcount method as well as developing a non-income measure of poverty.

The income-based figures are derived from estimates made by Chen and Ravallion (2000), which are regularly updated and posted on the World Bank research site on poverty monitoring (World Bank, 2001a). I use the US\$2/day version of the headcount estimates (the true figure is US\$2.15 in 1993 international prices) for the EEFSU region because there was very little poverty at the lower threshold (US\$1/day) in the late 1990s. The NIP idea is discussed below.

2.2 Growth–poverty hypotheses

We seem to lack a received theory of how growth leads to poverty reduction. It is most plausible that the growth process brings about changes in the underlying income distribution. Since estimating the entire distribution is hard, one instead looks at indicators such as the Gini coefficient or various intuitive measures of poverty. Headcount poverty, as stated above, is simply given by $H = F(z)$, where z is the poverty line and $F(x)$ denotes the cumulative density of income behaviour. Thus H will denote all those whose income or consumption falls below z , and hence are treated as poor.

Most work linking the growth process and income distribution typically focuses not on the headcount measure but instead on measures of inequality, such as the Gini coefficient. Using both cross-section and time-

series data, Kuznets (1963) discovered an inverted U-shaped relationship between inequality and growth. He reasoned that in the early stages of growth, as urbanization and industrialization get under way, inequality rises with growth. As industrialization gathers pace, however, the rapid absorption of rural migrants into the urban sector helps reduce income inequality. Indeed, Aghion, Caroli and Garcia-Penalosa (1999) suggest that the history of industrial revolution and beyond (especially in the United States between 1770 and 1970) bears this out: over the first hundred years inequality rose, only to moderate over the next hundred.

However, this view has been emphatically challenged by new empirical evidence that proceeds from two related approaches. Most pertinent to the present discussion is the observation that, in the already industrialized world (say, the Organisation for Economic Co-operation and Development), the greater equality resulting from continued growth appears to have been reversed in the past 25 years or so. Aghion, Caroli and Garcia-Penalosa argue that the growth process here operates through trade liberalization, skill-based technical changes and organizational changes within the firm, whose combined impact on growth has been such as to render the distribution of *earnings* inequitable. This throws doubt on the plausibility of the Kuznets process under present conditions.

2.3 *The Mellor story*

Focusing exclusively on developing countries, Mellor (2000) advances a hypothesis that connects economic development and poverty.³ He summarizes the global growth experience (possibly disproportionately influenced by the Asian experience) and finds that the growth spurt appears to originate in the key non-farm (labour-intensive) sector. The latter must in turn be sustained by steady agricultural growth, thereby generating robust demand for indigenous non-tradable goods produced by the non-farm sector. The feedback process, perhaps occurring after a lag, leads to growth of the urban sector as well (via a tightening of the urban labour market). This view therefore repudiates the Harris–Todaro hypothesis, which posited rapid urbanization and the attendant rural-to-urban migration as the engine of growth.

A priori, the above causation seems plausible.⁴ Clearly, for vigorous employment growth to occur one needs rapid growth in sectors in which labour intensity is relatively high; recent Asian experience shows that this condition occurs in the small-scale consumer goods and services sector, typically located in small towns and rural areas. To the extent that the output of the local non-farm sector is destined for the domestic non-urban market, the primary sector of the economy must provide the bulk

of the growth leadership. To quote Mellor, “it is the expenditure of this increased (primary sector) income on locally produced, labour intensive, non-tradable goods and services that drives the employment creation, that in turn, explains the poverty reduction” (2000: 18).

The final component of the reasoning is that rural non-farm job creation also has the effect of stemming the flow of migration from rural to urban areas. This would immediately lead to a tightening of the urban labour market (especially the low-skill informal and service component), and consequently to rising productivity and real wages in the urban sector as well. We have now come full circle: the growth spurt in the non-farm sector, itself fuelled by steady agricultural growth, leads to the growth of the urban sector as well. An implication of the Mellor hypothesis is that the growth momentum originating in manufacturing is unlikely to propel widespread gains in employment in the primary or non-farm sector, and thus will be unable to provide overall growth leadership.

Whereas development theories have been scarce, there has been a recent proliferation of empirical writings on poverty and growth. The standard result from the (cross-section) analysis on the subject suggests that economic growth is *necessary*, though not sufficient, for income poverty to decline (Dollar and Kraay, 2002; Ravallion, 2001). Indeed, these results suggest that the overall share of output going to the poor remains, *on average*, largely unchanged by growth. Ravallion (2001) also finds that persistent (and rising) inequality may dampen the poverty elasticity of growth. On balance, however, Chen and Ravallion (2000: 19) have described slow growth itself as a “far more important reason for the low rate of aggregate poverty reduction than rising inequality within poor economies”.

A second line of evidence in the current growth literature suggests that higher *initial* inequality hurts long-run growth (Alesina and Rodrik, 1994; Perotti, 1993, 1996; Persson and Tabellini, 1994), which Aghion, Caroli and Garcia-Penalosa (1999) interpret as repudiating the first arm of the inverted Kuznets-U. The type of inequality in mind here is along the wealth dimension. These authors argue that the likely explanation behind the result is that wealth inequality influences individual decisions with respect to human and physical capital, especially in the context of capital market imperfections and moral hazard, and hence hurts aggregate growth. Modern (endogenous) growth theories elaborate on this, and the contribution may be summed up by the following quote: “[T]he less developed the credit markets and the larger the separation between borrowers and investors, the bigger the scope of redistributive policies aimed at creating opportunities, improving borrowers’ incentives, and reducing macroeconomic volatility” (Aghion, Caroli and Garcia-Penalosa, 1999: 1631). Thus one would infer that high initial inequality slows down

poverty reduction, albeit indirectly, via slower growth. There also remains a concern that the poor typically fare disproportionately badly during economic downturns.

2.4 The implications for transition economies

Before examining how well the above theories may relate to the transition world, I shall briefly outline the poverty dynamics in the EEFSU region, which is the focus of the present study. The stark facts are simple. The transition process, namely the termination of the command system and the introduction of market and political liberalization, varied greatly from nation to nation. Important differences are observed in the speed of specific changes, the sequencing of economic versus political changes, and the mutual consistency of the package. Although all suffered from the recession that immediately ensued, its duration and severity differed perceptibly. Cornia and Popov (2001: 3) summarize the transitional recession as follows: in Eastern and Central Europe the contraction of output lasted for three to four years and ranged from 20 to 30 per cent; in most countries of the Commonwealth of Independent States, output continued to fall for seven years in a row and in 1999 was less than 50 per cent of the pre-downturn level. Hence one of the puzzles to be explained here is the differential performance among members of the EEFSU.

Another important feature relates to inequality. The initial inequality of earnings or expenditure, although lower than that in the OECD countries, still differed substantially in the EEFSU region. Social transfers (primarily pensions) made up close to 25 per cent of household gross income prior to liberalization, and thus played a role in keeping both measured poverty and the Gini coefficient low. However, the distribution of real consumption (and hence welfare), Cornia notes (2001: 196), was less favourable because of the shortages, which were especially severe away from large cities, and the necessary concomitant rationing. Strikingly, the transition process has seen a widespread rise in earnings, income and wealth inequality. A preliminary review of data (for example as provided in *World Development Indicators* – World Bank, 2001b) reveals that the increase was moderate in Central Europe but large in the countries of the former Soviet Union (FSU) and Southern Europe.

To the extent that one interprets the Kuznets hypothesis as suggesting that inequality promotes growth, as some earlier theories purported to do (see Aghion, Caroli and Garcia-Penalosa, 1999), modern growth theory and the evidence outlined above are in direct contradiction.⁵ Initial inequality would appear to exacerbate the consequences of incomplete markets for human, physical and financial capital in terms of the eventual returns accruing to firms and individuals. We would thus expect initial

inequality to play a role in the poverty performance of the region and in economic growth. The above reasoning would apply, *a fortiori*, to the concept of non-income poverty developed below, which is directly related to human capital outcomes (mainly health and education) during the process of development.

Although modern growth theory appears to provide a rationale for the recent OECD (mainly UK–US) evidence of rising wage inequality, Mellor’s hypothesis of rural (labour-intensive) growth rings true for the recent Asian experience. However, it is unlikely that either line of argumentation would have dominated the transition process, even though there is talk about rising wage inequality in the EEFSU region as well (more on this below). Here the foundational institutions necessary to sustain the market mechanism had been struggling to find roots (especially in the FSU republics). In the East European countries, which had an episode of market experience in an earlier epoch, it was a question of rediscovering the informal institutions needed to support formal institutions such as property rights and markets. The brief review of transition experience presented above fits well with this line of reasoning. Indeed, a central postulate of the present chapter is that the recent EEFSU growth process and the attendant poverty outcome have been fashioned by the policy framework as well as by the attendant initial conditions (chiefly the quality of institutions, both political and social). I elaborate on this theme in the next section.

2.5 The inequality–poverty nexus

I have already noted that both the analytical and the empirical evidence suggest that the poverty elasticity of growth depends on the evolution of inequality. Although growth appears to be, *on average*, neutral with respect to inequality (à la Dollar–Kraay) at a global level, the EEFSU experience stands in sharp contrast. In an attempt to identify the factors contributing to this process, Ivaschenko (2001) presents some preliminary results based on panel data for 24 EEFSU countries covering the period 1989–1998. Econometric tests indicate that variables that explain the rise in inequality include the Kuznets duo: per capita real GDP; and the same variable squared. In addition, he finds plausible roles for inflation, deindustrialization, privatization and the ageing of the population. It is conceivable that this latter set of factors also caused the decline in output in the first place. Additionally, Cornia (2001: 214) suggests that a growing concentration of pensions contributed to rising inequality in Russia and Poland.

Modelling income distribution before and after transition, Milanovic (1999) finds that wages (comprising all labour earnings, including fringe benefits in cash or kind from moonlighting, in both the public and the

private sectors) fell sharply as a share of disposable income (to about 50 per cent) in both Eastern Europe and the FSU by the mid-1990s.⁶ The decline was most dramatic in the FSU, where the pre-transition figure stood at 78 per cent. Worse, the wage distribution became much more concentrated than previously. Milanovic finds that increased wage concentration caused the overall Gini coefficient to rise. Indeed, given the large initial weight of wages in the functional distribution of income, wage concentration alone contributed up to 75 per cent of the increase in the Gini coefficient for most of these countries, notably Bulgaria, Russia and Latvia.

The Milanovic paper did not focus on transitional labour force participation issues. Newell (2001) finds that for countries such as Poland, which actually grew in the late 1990s, inequality still went up. However, using Polish labour force data, he discovers that *hourly* wage inequality remained about constant over the period. This must imply that, even at the low end of the wage scale, there must have been a productivity rise to offset in part the inevitable skill premium at the high end. He goes on to argue that rising income inequality is mainly due to the absence of workers in many households, as individuals stay on at school (formal or vocational), delay forming families and hence depend longer on parents, and take early retirement. The additional human capital accumulation aspect is rightly argued to bode well for the future of Polish labour, and thus Newell claims that not all rises in inequality need be viewed as bad.

The above line of reasoning is reinforced by Boeri (2001), who stresses that the early retirement phenomenon combined with the discouraged worker effect led to large withdrawals from the labour force. He finds that high unemployment persisted owing to the very slow flows out of the unemployment pool to new jobs. The very specific nature of vocational training in the communist era is pointed to as a major cause of poor labour mobility in the post-transition world.

It is quite possible that trade liberalization and changes in technology (recall the UK–US evidence cited above), over and above the dislocations resulting from the regime switch, may have played a part. However, to the extent that the emerging inequality is due to low participation, the underlying cause is likely to be dominated by declining or sluggish aggregate demand as well as the poor adaptability of the existing workforce to the need to switch into the relatively faster-growing sectors of the economy.

2.6 *Institutions and growth*

The extant literature is generally silent on the idea of institutional capital, except to note some obvious, perhaps significant, elements, such as decentralization. Even Mellor's (2000: 27) extensive review does not

identify a single contribution dealing with the interface between development and institutions in over one hundred references. In conclusion, however, he does note without elaboration that “democratization at the village level opens up far greater potentials for raising local resources and managing them better”. Likewise in terms of institutional issues, many authors refer to transaction costs, but by that they essentially mean transportation costs. As we shall see below, transaction costs are a much wider phenomenon than has been appreciated in mainstream writings in economic development.

The new institutional economics makes it very clear that institutions (for example, economic and political ones) are generally incomplete in any setting, which implies that transactions are costlier than they ought to be under the full efficiency paradigm. North (1990b: 362–364) makes a further point that the structure of transaction costs varies between political and economic markets in any society, such that “high transaction costs issues gravitate to the polity”. Insofar as countries (in transition or developmental mode for instance) suffer from the incompleteness of their democracies, the following quote from North (1990b: 364) is a useful reminder: “It is political markets in non-democratic polities that urgently need such transaction cost analysis. The far greater imperfections of such markets ... are the root cause of their economic performance since it is polities which devise and enforce the property rights that are the incentive structure of economies.” One may extend this further to suggest that extensive public control (for example via state-owned enterprises), a cumbersome regulatory framework and weaknesses of the judiciary all combine to render the transaction cost structure in the developing and the transition world a fertile ground, where the stated pattern of selection (from the economic to the political arena) becomes a dominant process.

The transitional literature has of late come to highlight the role of institutions. Indeed, the thrust of Cornia and Popov (2001) is to identify the extent to which initial structural and institutional conditions explain output performance in the transition world. Cornia goes on to argue that “the pace and pattern of institutional development explain in part the variation in inequality trends and growth performance of the transitional economies over the past decade” (2001: 192). Although the Cornia–Popov approach is similar in spirit to mine, their qualitative discussion focuses on a broad range of attributes as indicators of institutional changes – privatization, wage-setting regulations, reforms of pensions and transfers, the functioning of markets for finance and, importantly, the capacity of the state to collect revenue and carry through reforms. These are potentially significant, but my approach to the concept of institutional capital, as detailed in the next section, is entirely different. I agree with the central tenet of the NIE that low-cost transacting is essential for economic growth; furthermore, the cost of transactions varies a lot

between the different systems of institutions prevailing across societies. Lower transaction costs, in both the economic and the political sphere, should in principle allow faster growth and therefore affect the (income) poverty outcome. An important question then arises: does institutional capital have an independent influence on poverty over and above the effect on growth?

2.7 Non-income poverty

I have already outlined the emergence of a broader conceptualization of poverty, which highlights non-income dimensions. Kanbur and Squire (1999: 2) argue that non-income poverty (NIP) not only expands the set of policies relevant to poverty reduction but also requires that the interactions between such policies be recognized. They contend that the various dimensions of poverty interact in important ways – “policies do more than simply add up”. For example, improving people’s health increases their income-earning potential, increasing their education leads to better health outcomes, and so on. Poverty-reducing strategies must recognize these interactions.

To digress a bit, it may appear that in adopting a broad interpretation of poverty one is unwittingly led to confound the inputs and outputs of the growth process. Surely if education were always to lead to income gains (via the human capital route), counting both income and educational attainment as the product of growth would be tenuous. However, health attainment may result from quality public investment, without necessarily yielding much of an income gain over the period in review. Therefore, the rationale for a separate role for NIP exists at least on account of market imperfections (especially at the input level).

There is little in the literature that examines whether the growth–poverty (income) hypotheses discussed above also extend to NIP. It would be important to know if the initial wealth distribution, which surely affects human capital as well as physical capital investment possibilities most directly, plays a part in determining the level of broader poverty. Similarly, one would expect a better quality of economic, political and social institutions (measured by the concept of institutional capital) to make for greater access to health, educational and physical (including public utilities) infrastructure. Hence, levelling the playing field is likely to have a direct bearing on the NIP outcome for a given level of output growth.

2.8 Poverty and institutional capital

The linkage between poverty and institutional capital (IC), especially via gains in income and directly for the broader dimensions, is intuitive,

though possibly poorly documented for the EEFSU region. Many believe that the peer-monitoring model of micro-lending pioneered in Bangladesh and replicated pretty much worldwide succeeds because of the social capital (for example, trust within the group and between the group and the lender) that emerges in a setting typical of non-governmental organizations (NGOs). The essential idea is that group lending allows the lenders to overcome the informational asymmetries typical of any credit delivery mechanism. Moral hazard and adverse selection are the usual impediments to the functioning of the market in such a context. The principal devices by which these hindrances are minimized include peer monitoring and social sanctions within the group (and, possibly, the local community). These devices are further believed to serve as safeguards against excessive risk-taking, misuse of funds and default behaviour. They work even when the borrower puts up no formal collateral (as in the case of the Grameen Bank). Such NGO and related voluntary civil society activities, over and above direct income gains (because the former are typically targeted on the very poor), may allow additional benefits in health and education, which contribute to the alleviation of non-income poverty.

2.9 Testable hypotheses

At this stage the following hypotheses (most are not mutually exclusive) emerge from the preceding discussion. I shall attempt an evaluation of these with the available data.

- Explaining growth
 - P1: Higher initial inequality hurts growth* (growth theory)
 - P2: Growth depends on institutional capital* (NIE)
 - Explaining inequality
 - P3: Growth causes inequality to rise* (Kuznets, 1955)
 - Explaining poverty
 - P4: Growth is good for the poor* (Dollar and Kraay, 2002; Chen and Ravallion, 2000; Ravallion, 2001)
 - P5: Faster growth in the rural labour-intensive (non-farm) sector leads to greater poverty reduction* (Mellor hypothesis)⁷
 - P4a: Poverty = f(growth, IC, inequality)*⁸
 - Explaining NIP
 - P6: Initial inequality and poor institutions retard the fight against NIP*, i.e. $NIP = g(IC, inequality)$; however, for completeness,
 - P6a: NIP = h(growth, IC, inequality)*
- And finally,
- Path dependence (North–Schotter) hypotheses:
 - P7a: IC = j(DUM)*, where DUM denotes a zero/one dummy variable depending on whether the country in question had an episode of market institutions

prior to communist rule following the Second World War. Combining P2 and P7a,

$$P7b: \text{Growth} = k(DUM, IC).$$

3 The conceptual framework of institutional capital

In this section I focus on the conceptualization of institutional capital (IC); its operationalization is discussed in the methodology section that follows. As noted already, my construction of institutional capital encompasses the existing notions of its constituent parts, with some unavoidable overlap. The principal elements are taken up in turn.

3.1 *Costs of transactions*

In this chapter, I refer to all human interactions of an economic nature (that is, economic exchanges) as “transactions”. The standard general equilibrium analysis in the Arrow–Debreu fashion embraces the parable of the Walrasian auctioneer, a device that coordinates economic exchanges in a timeless and costless manner. Market failures are viewed as aberrations created by large externalities and/or significant non-convexities in production technologies (Arrow, 1970). Why discard the orthodoxy?

It is helpful to review what transaction costs are, before exploring why they arise. Matthews interprets them as “the costs of arranging a contract *ex ante* and monitoring *ex post*, as opposed to production costs, which are costs of executing the contract” (1986: 906). There are various ways of accounting for the non-trivial costs of coordination, which is necessary for mutually beneficial transactions. Williamson enumerates the following as important: first, “the organisational man is cognitively less competent (being subject to bounded rationality) but motivationally more complex (being given to opportunism) than his economic man counterpart”; these behavioural attributes in turn demand that one “organise transactions so as to economise on bounded rationality while simultaneously safeguarding them against the hazards of opportunism” (Williamson, 1984: 200).

North (1997), on the other hand, cites *four* variables that make for costliness in exchange. To me these seem to corroborate the above. First he cites “the cost of measuring the valuable attributes of goods and services or the performance of other agents in exchange” (1997: 2), which can be seen as a consequence of bounded rationality à la Kuznets, as cited above. Second “is the size of the market, which determines whether personal or impersonal exchange occurs” (1997: 2) – exchange based on kinship is an example of personal exchange. Third is the absence of a

“third party impartially (and costlessly) evaluating disputes” (1997: 3). The second and third variables may be viewed as primarily arising out of opportunism. The fourth element offered by North deals with ideology that “individuals possess to explain and evaluate the world around them” (1997: 4), which matters in exchange because of the costs of measurement and enforcement. Although North appears not to elaborate further, presumably ideological differences may call for different responses from different agents in a given environment, with the consequence that certain exchanges may be difficult to complete. Interpreted in this manner, the tenets of bounded rationality and opportunism combine to allow a role for ideology in economic exchanges.

3.2 Institutions and coordination

Practically all scholars in the NIE mode of analysis argue that “institutions” evolve so as to enable coordination of exchanges. It is therefore implicit that institutions must minimize the costs of exchange to render them viable. Matthews observed that transaction costs may affect economic exchanges individually (and hence be incremental in nature) or may appear in the form of altering the overhead (i.e. the fixed cost). Further, the choice of institutions (as well as the choice of technique) may affect both the transaction costs and the production costs, in which case agents would seek to minimize the sum of the two, and thus trade-offs may arise. In this set up, the efficiency of an economic system (i.e. a system of institutions) is gauged by the efficacy with which the prevailing rules succeed in minimizing the transaction costs for given technologies.

Whereas formal institutions (rules or constraints, as these are variously labelled in the literature) have long been understood to be prerequisites for market transactions, Kenneth Arrow (1970) might have been the first economist to highlight the role of informal rules in the process. In a rather illuminating, though short, section of his 1970 paper on the choice of market vs. non-market allocation, Arrow remarked that “norms of social behaviour, including ethical and moral codes,” may be interpreted as “reactions of society to compensate for market failures” (1970: 70). Arrow singled out the norm of mutual trust as being capable of serving the non-market allocative power alluded to above. He noted that, “in the absence of trust, it would have been very costly to arrange for alternative sanctions and guarantees, and many opportunities for mutually beneficial co-operation would have to be foregone [*sic*]” (1970: 70). In this context, Putnam (1993) and others focus on trust as a primitive but powerful example of social capital.

It must be emphasized here that Arrow (1970: 71) focused on only one aspect of the benefit of social norms, namely that relating to “improving

the efficiency of the economic system (in the broad sense of satisfaction of individual values) by providing commodities to which the price system is inapplicable". Indeed, he believed that "there is a whole set of customs and norms" that would allow a similar interpretation. Social capital, as noted above, is believed to be the primary explanation of the success of no-collateral micro-lending, which has gained prominence over the past 20 years. Studying group-based peer-monitored programmes, such as the Grameen Bank, a number of theorists have persuasively argued that the design, monitoring and enforcement of loan contracts take advantage of local information, and succeed owing to social collateral.⁹ Informal rules such as trust and social sanctions, being largely self-enforcing, provide the key ingredients of the compliance-friendly regime.

Civil society, we note, comprises voluntary associations of individuals (much like Putnam's amateur choirs) designed to interact socially, which may have an avowed mandate to seek certain economic or political benefits (for example, fair local elections) for the benefit of its members (and, because of externality, other non-participants). The chosen means of behaviour is non-market, typically lobbying and networking. These may well be activist groups. But essentially, although the nuances vary, it is *civil* social capital (see Collier, 1998) by another name. Hence our view of informal institutions would also encompass the civil society. Raiser (2001) suggests that civil society institutions indeed help to sustain and reinforce both moral and social norms.

3.3 Properties of formal and informal rules

First note that discussion by both Arrow and North suggests that formal rules by themselves may not suffice. Leibenstein (1984: 75), who also contributed to this literature, concurs: "the market exists as a powerful co-ordinating mechanism, but only when supported by other co-ordination mechanisms of a non-market character." Matthews (1986) points out why this is a plausible view; playing by social norms does not typically incur formidable transaction costs.¹⁰ By contrast, focusing on formal institutions, Coase (1960) had maintained that any *complete* system of rights was in principle capable of leading to Pareto efficiency. Here completeness is defined as all rights and benefits being attributed to someone, and these rights being fully tradable. Clearly transaction costs (chiefly in political markets) may render the observed system of rights incomplete. Hence the norms and conventions may be seen as alleviating market failure; in their absence, market failure would have been a more pervasive phenomenon than it already is.

It is therefore interesting to observe that the norms of society, although costly to achieve and perhaps to modify, provide for low-cost transacting

once they are in place. Arrow had observed that “the arrangement of these agreements and especially their continued extension to new individuals entering the social fabric can be costly” (1970: 71). Kaufer (1984) notes a likely rationale for the costs: norms and conventions arise as the result of human action but not of human design. And, perhaps as a way out of the costly coordination mechanism, “as an alternative, society may proceed by internalization of these norms to the achievement of the desired agreement on an unconscious level” (Arrow, 1970: 71).

The emphasis by Collier and sociologists that social capital arises out of non-economic interactions is not of consequence when one judges the efficiency of an allocative device. An economic externality that emerges as a by-product of social interactions fulfils a hitherto unsatisfied demand. Thus it is abundantly clear that social capital does help in lowering transaction costs such as to render market transactions feasible (as in Leibenstein) or to provide a non-market medium of exchange (as in Arrow). At one level, therefore, this is a rather interesting dimension of the externality issue, albeit with a happy outcome, namely that a non-market allocation may become feasible and be Pareto-superior vis-à-vis the status quo.

3.4 Governance

Williamson (1998) offers the following interpretation of the linkage between the concepts of “institutions” and “governance”. If institutions are seen as laying down the rules of the game, governance, on the other hand, conducts the “play of the game”. However, the plays must in turn be governed by other means (institutions), hence the usage of the term “governance institutions”. Not only are rules needed *ex ante*, but one also has to monitor the *ex post* performance and make up for any necessary restitution. I have already noted the incompleteness of the system of property rights, which is a source of tension in an exchange. Another area of potential conflict is that the allocation of authority embodied in a contract, and consequently the distribution of payoffs, need not be symmetrical (chiefly owing to asymmetric asset specificity) among the parties involved (Matthews, 1986).

Williamson expands on this theme. He views governance as “the means by which order is accomplished in relation to which potential conflict threatens to undo or upset opportunities to realise mutual gains” (1998: 76). Conflicts in exchange may occur as a result of the asset specificity of agents (bilateral dependency) or wherever contractual hazards may arise. He elaborates, “most of the governance action works through private ordering, with courts being reserved for purposes of ultimate appeal.... Contracts, albeit incomplete, are interpreted in a farsighted manner,

economic actors ... perceive potential hazards, and embed transactions in governance structures that have hazard mitigating purpose and effect" (1998: 76).

The scope of governance as construed by Williamson is both broad and specific. The broadness is in the inclusion of all means, private and coercive, of keeping the ball in play. The notion is restrictive in that it accords to conflict resolution between private parties to an exchange contract. For instance, firms are viewed as a "governance structure" here. However, in the developmental context, the term virtually focuses on actions within the public domain and those carried out by the processes and institutions deliberately designed by the polity to safeguard the rights and obligations of individuals and groups in private as well as other exchanges. Examples of the latter would include exchanges between private parties, on the one hand, and government bodies (including state-owned enterprises), corporations, NGOs and civil society, on the other. Consequently, the domain of governance for our purposes is extremely broad and would cover all that the polity has committed to deliver (from provision of law and order to regulation of monopolies, basic rights and freedoms, including rights to information relevant to private decisions). The quality of the governance then has to be measured by how well the polity has performed in the execution and the monitoring of institutions, and in appropriately remedying any losses.

It is important to recognize that governance as construed here must extend to the role of norms and conventions, namely social capital. Clearly some of these institutions may not be formally coded in the laws of society and hence may not be enforceable by the polity. However, human interaction may evolve in delivering an informal structure of governance, for example that carried out by a civil society structure (for instance, a village arbitration body). Such a structure would work so long as both parties in a conflict agree to abide by the verdict or face social sanctions, even though the verdict or the consequent sanctions may not be part of the formal legal statutes of the land. Again, the adequacy of these informal governance structures may be judged in similar ways to those applied to formal governance.

To further illustrate the scope of governance in terms of formal institutions, take the case of property rights. These rights (for example, relating to arable land) are generally coded in the legal statutes (an example of a formal institution). The governance elements would include the bureaucracy in charge of keeping all original records of such titles to property and subsequent transactions thereof. The bureaucracy itself may well resolve any dispute between a private individual and the polity, or between or among private parties themselves, concerning the records. Recourse to intermediation by the judiciary is always a last resort, the

judiciary being a further but important element of the monitoring institutions. Legal titles to assets, or changes thereto, are usually drawn up in the presence of witnesses, a process that may be aided by social norms (including sanctions), which in turn may also help in sustaining the legal rights of members, who may not contest titles to property frivolously. The latter phenomenon may illustrate the scope of private ordering à la Williamson. Governance would also involve evaluating how well any restitution imposed by the bureaucratic/judicial process has been carried out. Here again, enforcement may be aided by both the formal intermediation of the police and/or informally. The spectre of social sanctions may be sufficient to ensure compliance with local norms. In sum then, social norms (possibly aided by civil society structures) help sustain both the legal and bureaucratic edicts related to property rights, so that formal contests over adherence or enforcement are kept to a minimum. Good governance therefore requires a strong helping hand of social norms and sanctions.

3.5 *Institutional capital*

It may be noted that North's characterization of the institutional requisites of low-cost transacting calls for a large menu. From transparent law-making as well as its enforcement, one may articulate the need for political (and fiscal) decentralization and intervention in factor and capital markets to make them perform more efficiently (i.e. competitively), and seek means of weakening rent-seeking interest groups. If one were to embrace these all as equally desirable, the range both of institutions (rules) and of governance mechanisms (conduct of the game) would widen considerably. By contrast, much of what goes under the rubric of governance in current economic development parlance is clearly selective. In principle, the *efficacy* of the entire set of institutional elements aimed at lowering transaction costs would be the conceptual benchmark for governance.¹¹ And it is this totality of institutions (both rules and conduct of the game) that I shall refer to as the institutional capital of a society. In sum, these are devices that allow the coordination of exchanges, which is of necessity a resource-using process. The quality of a body of institutions may be gauged both by the relative level of costs and by the relative range of exchanges that become viable at a point in time (vis-à-vis other societies).

Matthews believes it would be hard to do a Denison type of econometrics and isolate the contribution of institutional capital to growth as distinct from the standard sources. However, he does note that, in spite of the inherent confounding of formal measurement, it is more reasonable to pose the *qualitative* question. In the next section I enumerate

how precisely one may select and measure the indicators of institutional capital.

3.6 Evolution of institutions and path dependence

Given that many institutions (especially informal ones of the social capital variety, say) seem to evolve rather than being deliberately designed, it is inherently difficult to explain how changes occur over time. Although the self-interest of economic agents may exert some tendencies to “seek out and find institutional arrangements that are mutually advantageous and to adjust old ones in light of changing circumstances” (Matthews, 1986: 912), this path need not resemble a Pareto-enhancing evolution. North essentially echoes this view. To him, not only would the real world institutions be incomplete, their adaptation over time would also remain “suboptimal”. He goes on to establish “the incremental character of institutional change ... as a preliminary to showing how such inefficient paths of change can persist through time” (North, 1989: 665). Among the reasons for such an impasse, Matthews identifies the following: non-benign state interventions; transaction costs; inertia (owing to the costs of coordinating a change); and complexity (owing to the unavoidably intertwined nature of institutional and non-institutional, for example technological, forces).¹²

Matthews argues that certain forces tend “to make technological change more difficult than institutional change. For example, technological change may need to be embodied in expensive capital equipment.” Besides, the state’s coercive powers do not extend to the laws of nature, “so that there is every reason to suppose that the state’s involvement serves to speed up and facilitate institutional changes relative to technical change. Sometimes this may be synonymous with facilitating the emergence of institutions that conduce to economic growth; but sometimes it may be the reverse” (1986: 916). However, institutions do change. Matthews cites two factors that may influence changes: relative prices and changes in preferences.¹³ Moreover, the agents of change must be political and economic entrepreneurs. If the rules and their enforcement are to minimize the payoff to opportunism and to induce economic decisions even when rationality has constraints, modes of behaviour need to lead to alteration of both formal and informal rules. However, one has to guard against the pitfalls of the process, especially in the political arena.

I elaborate on a possible channel of institutional change for the worse. I shall argue that the inadequacy of the set of rules and/or of the governance thereof can lead to a loss or weakening of the social capital embedded in various institutions, formal and informal. Or, worse, it may induce the formation of a variety of behavioural practices that generate

negative externalities. Negative externalities can arise, for example, when (local) government officials, business lobbies and their minions collude to form an alliance to control the bidding for government contracts, seek control of newly privatized entities, interfere with the delivery of social spending programmes (for example, health and education) and/or disrupt NGO activities in health, education and microcredit. The primary goal of these alliances may be to engage in rent-seeking in general and possibly to further political goals in the process.¹⁴ Of course, such alliances are an extreme form of corruption, and can operate at all levels of society if purposely patronised by elected officials along the chain. These alliances in effective endow society with social capital of a negative variety, and may even destroy the “good” social capital that may be embodied in extant alliances represented by groups such as teachers’ associations, gender-based activist groups (including NGOs), doctors’ groups, chambers of commerce, small trade lobbies, farm lobbies, consumer groups, and the like.

Path dependence

A key ingredient in the analysis of institutional change is the path dependence proposed by Schotter (1981) and by North (1990a).¹⁵ The best description of North’s thesis is captured thus: “If the process by which we arrive at today’s institutions is relevant and constrains future choices, then not only does history matter but persistent poor performance and long-run divergent pattern of development stem from a common source” (North, 1990a: 93). In this context, North distinguishes between the concepts of the “stability” and the “efficiency” of institutions, and finds institutions to be generally stable. Stability is explained by the hierarchical nesting of institutions, where “each level is more costly to change than the previous one” (1990a: 666). Viewed in this light, persistence or stability does not necessarily make for efficiency. He goes on to give a more complete interpretation of efficiency: “efficiency would entail both stability conditions and institutions that provide incentives to organizations to become more productive” (1990a: 666).

There appears to be a clear verifiable implication of the North–Schotter view of the evolution of institutions. Even if two countries have similar formal rules (for example, constitution and parliamentary democracy), any differences in the informal rules, being slow to evolve, would make a difference to their relative economic performance over time. Hence the claim here is that, among transition economies with similar formal rules (post-liberalization), those that inherited a friendlier system of informal rules would perform better. Naturally the latter feature may be present in countries that, in spite of having operated under the command system following the Second World War, had enjoyed political and civil liberties

earlier (for example, Eastern Europe). Indeed, North has suggested that countries with well-developed norms and conventions from an earlier epoch may do better in embracing a return to essentially the old mode of doing business. Following this line of reasoning, one would attribute the presumed slow adjustment to reforms in the FSU republics to the lack of good-quality informal institutions, which are required “to provide a hospitable foundation for the establishment of formal rules” (North, 1997: 16).

3.7 EEFSU transition dynamics

What have been the major causes of the differential performance of various countries as regards output and the poverty level? It is unlikely that differences in initial inequality provide the answer. Nor it is plausible that differing growth explains the entire change in poverty (once allowance has been made for the role of initial inequality). The literature that probes these issues is voluminous. However, the broad thrust of arguments advanced by several authors appears to fit the context of the present analysis. I identify three arguments here: institutional discontinuity; the consistency of the reform package; and the capability of the state.

Institutional discontinuity

I have already argued that transition to a market economy requires both formal and informal institutions. Although the rule of law, to illustrate, is a prerequisite for the functioning of private property rights, it can be sustained only by adequate legislation, an independent judiciary, honest law enforcement and, above all, public obedience to legal statutes. The last usually inheres within the community as part of its tradition and values. If the socialist state contributed to the degradation of civil society and its conventional value system, as has been argued by Raiser (2001), and replaced it with loyalty to party hierarchy, it will take time for the rule of law to be accepted during the transition phase. When countries launch a transition process, they usually adopt a whole set of economic (and typically political) reforms, and thereby attempt to implement the formal rules consistent with a market economy. However, they generally inherit the pre-existing informal order, which may contradict, or at least deter, the smooth functioning of the formal rules. As elaborated above, informal rules take a very long time to change. I earlier noted the important role that civil society might play in aiding the process of adherence to the emergence of coordination-friendly informal rules. Unfortunately, many of the FSU republics lacked any coherent structure of civil society. There are indications that even the role of the basic institution of the family was marginalized in Russia (in sharp contrast to the

opposite tendencies in China; see Raiser, 2001: 226–227). Hence, depending on the country in question, one may face total institutional collapse in the interim (as observed by Cornia and Popov, 2001) or, at best, some functional degree of institutional discontinuity.

Indeed, one would expect the East European nations to have faced a milder degree of institutional collapse because they experienced the market economy prior to the socialist rule and thus the associated informal institutions could quickly reassert themselves. Although the informal rules tend to persist, a nation may, as noted above, also lose its once inherited institutional capital. One such process would be the persistent neglect or denial of the nation's institutional capital by the state (for example, corroded by the system of perverse individual and group incentives practised by the public authorities).

Consistency of the reform package

It is relevant to note that not all EEFSU countries have proceeded at the same pace with the process of transition. Kolodko (2000) observes that transition to the market mechanism involves more than mere market-friendly reforms (deregulation, privatization, and so on). Consistency here relates to the coordination of economic and political institutions. Kolodko notes that the Czech Republic, Estonia, Hungary, Lithuania, Poland, Slovakia and Kyrgyzstan were among those to embrace a vigorous transition process. In contrast, Russia and Ukraine, and perhaps to a lesser extent Bulgaria and Romania, moved only gradually, often taking steps in the face of fresh crises, hence reflecting a lack of overall strategy. Moreover, the necessary electoral and political changes had been slow, piecemeal and indecisive in these cases. Such lapses have contributed to poor governance and a lack of credibility in the political leadership of the country – witness the leadership crisis in Russia and the plummeting ratio of tax revenue to gross domestic product (GDP).

Capability of the state

One often belittles the cumulative value of the gradual but perceptible changes that were undertaken mainly through economic (i.e. market) reforms during the socialist reign. Given that these reforms were undertaken while the state had full authority (i.e. governance by coercion), society was able to develop appropriate behavioural (supply) responses to these measures, and the results have been generally positive. Many authors credit China's (and to an extent Viet Nam's) dramatic success to reforms being practised within a system of institutional continuity; indeed, central planning was not abandoned until market institutions had been developed. Kolodko (2000: 76, 232) identifies Croatia, Estonia,

Hungary, Poland and Slovenia as benefiting the most from pre-liberalization reforms. Interestingly, the market-oriented reforms took hold in countries that had a “hospitable” set of informal institutions. Kolodko goes on to elaborate: the more extensively that the socialist centrally planned economies were reformed, the shallower and shorter was the transitional recession. Raiser examines the Polish situation closely, and highlights the value added to gradual reforms undertaken over the years. One measure of this success is that, by the time the transition began in 1989, the share of *non-agricultural* GDP in the private sector already stood at 35 per cent. Recall that agriculture had never been collectivized in Poland.

In sum, I believe that these three factors – the degree of institutional continuity, the nature of the interplay between economic and political reforms, and the head start through reforms undertaken while the state still had the authority to govern and to implement policies – differentiate the winners from the losers in the transition process. Note that this is very much an institutional story, one that fits the premise of the path dependence hypothesis very closely. Although it is difficult to estimate and isolate these separate elements econometrically, I believe this to be a potentially more fruitful approach. In contrast, examination of variables such as differences in the underlying inflation rate, the success of revenue collection, export drive and the pace of liberalization has occupied disproportionately more space than is justified in the current literature on the subject. Narrowly focused studies of this sort would make sense only if one had a firm theory of success in transition, and we are far from there.¹⁶

3.8 The plausibility of testable predictions from theory

In section 2, partly in anticipation, I identified several hypotheses linking institutional capital and the working of the growth–poverty–inequality nexus (namely P2, P4a, P6a, P7a and P7b). The potential effect of institutional capital on these indicators (for poverty, both income and non-income dimensions of poverty) has been fully articulated above.

I acknowledge that institutional capital may also explain the evolution of poverty by materially influencing the efficacy of the traditional growth-led theories, namely the Mellor hypothesis (P5), even though it may be a little complex. The difficulty lies in describing the emergence of the rural labour-intensive (RLI) industry. Several institutional aspects may provide part of the explanation. A responsible local government, sound zoning laws and the availability of physical infrastructure all have a role

to play. One may further include the importance of adequate provisioning of energy supplies, power and natural gas as appropriate. On the supply of labour, one may hypothesize that the growth of the RLI sector is facilitated by the fact that potential workers do not have to relocate far, if at all, to be engaged in high-productivity employment (vis-à-vis alternatives in the surplus-labour farm sector or in the credit-constrained rural informal sector). The proximity to the home base allows them to draw on a familiar network of social capital (for example, via familiar civil society units). By contrast, such access would be severed were the same individuals to move to the “city”. However, I am not aware of any detailed study corroborating such eventualities. Similarly, one may also suggest that growth in agricultural income may sustain the RLI sector growth, because the products are more familiar to their perceived demand, making transactions easier to accomplish. (Clearly this would hinge on the relevance of the bounded rationality arguments advanced by Williamson and North.) In other words, rural people do not relate as easily to the attributes of goods produced by the urban sector. The explanation here is therefore very much an institutional one, being based on the cost of transactions among goods of different quality produced by different sectors of the economy.

I will not pursue this issue for a number of reasons. First note that bottlenecks in private family-based farming were very severe in most FSU countries, and hence the EEFSU growth spurt could not possibly have originated there. Besides, many discouraged workers took refuge in the rural sector, adding to the masses of workless households and reinforcing the first factor. Finally, the lack of detailed and consistent sectoral data is a serious drawback in empirically verifying the hypothesis.

4 Methodology and data issues

4.1 Growth and inequality behaviour

The empirical work described below attempts first to explain the growth process and the evolution of inequality, and then moves on to analyse the effects of variables such as growth and institutions on poverty (both income and non-income). The growth and inequality behaviours follow recent empirical work using cross-country data carried out by Alesina and Rodrik, Perotti and others. The focus here is on the role of initial inequality (as implied by modern growth theory) in explaining growth, and the possible role of institutional capital in that process (see hypotheses P1 and P2). I note at the outset that, owing to the small sample size, it is over-ambitious to obtain statistically robust estimates.

4.2 Poverty elasticity of growth

I motivate my econometric specification of the poverty equations as follows. The discussion in section 2, especially hypotheses P1 and P2, suggests that

$$GRO = f(IC, IIQ), \quad (2.1)$$

where GRO and IIQ denote, respectively, the growth rate of output and the level of initial inequality. The empirical literature dealing with the poverty elasticity of growth (for example, Datt and Ravallion, 1992) shows that the change in poverty, ΔH , between two points in time can always be decomposed into a growth component and the effect of a change in the underlying distribution.

The poverty elasticity of growth highlighted in the empirical literature focuses on the first of these two components. In that context, Kakwani (1993) derived an elasticity for all poverty measures in the Foster–Greer–Thorbecke class (Foster, Greer and Thorbecke, 1984).¹⁷ The headcount measure, $H = F(z)$, used here corresponds to the FGT poverty measure with $\alpha = 0$. Since the growth component in the decomposition amounts to a distribution-neutral shift (in relative income), the interpretation of the poverty elasticity is simple. The elasticity figure merely yields the number of persons who would cross the poverty line when mean income increases by 1 per cent.

However, it is an observed fact that growth seldom leaves relative incomes unchanged. In view of this, Bourguignon (2000) examined the issue assuming that income follows a lognormal distribution, which yields:

$$(\Delta H/H) = -\varepsilon(DEV, IIQ) \cdot GRO + \beta(DEV, IIQ) \cdot RIQ. \quad (2.2)$$

Here the right-hand-side variables include the level of development (DEV , measured by the ratio of mean income to z) and the change in inequality (RIQ).¹⁸ The ε -function is the (headcount) poverty elasticity, which under the conditions of the Bourguignon model rises with DEV and decreases in IIQ . Indeed, for the lognormal case, the elasticity has a simple closed-form solution (see equation (5) in Bourguignon, 2000). Distributional change (measured by RIQ) is also accompanied by a coefficient (β) that itself is a non-linear function of DEV and IIQ .

I now invoke hypothesis P3 explaining the change in inequality. This has an old Kuznetsian history, as well as a modern growth connotation as reviewed in section 2, requiring us to rewrite RIQ as a function of growth. Combining (2.1), (2.2) and P3, we obtain:

$$(\Delta H/H) = -\varepsilon(DEV, IIQ) \cdot f(IC, IQ) + \beta(DEV, IIQ) \cdot RIQ(GRO) \quad (2.3)$$

or

$$(\Delta H/H) = g(DEV, IIQ, IC, GRO). \quad (2.4)$$

Thus, once we have utilized the growth–poverty identity implicit in (2.2), a separate growth contribution is associated only with increased inequality. My empirical specification (see section 5) is essentially a linear approximation of (2.4) with growth appearing as a key independent variable.¹⁹ The implication, however, is that it would be hard to decompose the results into growth and distribution elements à la Bourguignon–Datt–Ravallion. For example, the *IIQ* variable would affect poverty by influencing growth (as in hypothesis *P2*), but initial inequality also affects the poverty elasticity directly through the decomposition discussed above. Similarly, growth affects poverty via the standard elasticity, and possibly by changing the income distribution. Clearly a lot remains to be done.

4.3 *Non-income poverty*

Although the derivation of (2.4) relates to income poverty, I estimate similar relationships for non-income poverty measures as well. To the extent that income gains do not measure the relevant benefits of economic growth, one may extend the above analytical reasoning to this task as well.

4.4 *Operationalization of institutional capital*

Here I focus on identifying those elements that help lower transaction costs in exchanges between individuals (or groups). I group these into three categories: those lowering the costs of information and communication; those supporting market competition; and those strengthening social capital.

Information and communication costs

The quality of the information regime (for example, the information communication technology at the public's disposal) has a direct influence on the efficacy of exchanges. Possible indicators include the extent of the transportation network (especially rural and around the main production and market centres), the rural energy supply and the telecommunications system (both wireless and conventional). The degree of computerization (for example, the number of diploma holders or the export value of software) is another element. Decentralization (administrative and fiscal) allows rural residents easier access to local public goods, and this may be

viewed as lowering the communication costs compared with a unitary system of government.²⁰ Local government revenue as a share of national revenue may be taken as a rudimentary measure of decentralization.

Market competitiveness

The quality of public expenditure in health, education and physical infrastructure and the availability of credit are critical to the performance of the markets for labour and credit. Formal institutions such as the legal/regulatory framework, the quality of the bureaucracy, the judiciary and bank supervision are all significant. However, data on many of these are hard to assemble for a group of countries. The following elements, on which data are generally available, may therefore serve to gauge the level of market competition instead.

Rule of law

Whereas the World Bank Institute (WBI) cites this factor as one of six indicators of “governance”, I treat this as part of the formal institutions as spelled out in section 3. The WBI information is based on surveys of perceptions of the quality of governance carried out during 1997–1998. Describing the design of these indicators, Kaufmann, Kraay and Zoido-Lobaton (1999a) argue that aggregating a diverse set of published indicators into categories representing certain aspects of institutional capital is more reliable for cross-country comparisons than individual attributes. They use an unobserved components model to find the underlying IC variable in the range of indicators for a given category such as “rule of law”. They also correct for the fact that several indicators do not have a sample that is representative of the global distribution.

Corruption

Control of corruption may be seen as helping markets to function (in the allocation of public contracts, allocation of credit, public sector employment, career advancement, and the like). Pervasive corruption typically stands in the way of private firms getting established and growing.

Social capital

This chapter highlights the role of informal institutions in strengthening or even supplanting the market mechanism. Although, ideally, one would wish to have data on trust in society (among individuals, among groups and between individuals and branches of government and judiciary), the extent of networking and participation in voluntary and civil activities, this is not feasible at this time.²¹ Some authors (for example, Inglehart et al., 1998) have compiled measures of social capital for a number of countries, but these are most inadequate for the sample of countries

being considered here. In the absence of direct observations on trust, variables such as microcredit availability, the density of NGO and other voluntary agency activities, and wireless telephony (critical to rural group coordination and networking) may be valuable. Unfortunately, even this information is not available at the cross-section level.

I finally adopt two more of the governance elements compiled by the WBI as rough indicators of social capital in society. These are (a) political stability/lack of violence, and (b) voice and accountability. Whereas the second of these appears to reflect strong civil society, social cohesion (and hence trust) may be associated with the lack of violence. Of course, both these components may also emerge primarily out of good governance and monitoring institutions. The point remains, however, that, without a vocal and active civil society, monitoring is usually poor.

To sum up the discussion on institutional capital, note that data on many of the broad features I have discussed above are not available for the present EEFSU analysis. For future reference, I nevertheless enumerate these in the form of a schema (fig. 2.1). I am thus led to rely on the available data and, in that context, I have selected four indicators derived by the WBI project on governance (World Bank, 2001c).²² I have chosen control of corruption and the rule of law as measuring the quality of formal institutions, while political stability/lack of violence and voice and accountability proxy for social capital indicators.²³ Note also that indicators such as the Freedom House index of political and civil rights (as used by Rodrik and Persson–Tabellini in related work), as well as the Transparency International corruption index, are already incorporated in the construction of the WBI indices, although there may be a lag. Hence there may be a case for using the most recent version of one or both of these indices as an alternative.

Table 2A.4 in the appendix to this chapter displays the data on the four aggregate indicators of the quality of institutions chosen for the present analysis. Although Kaufmann, Kraay and Zoido-Lobaton (1999a) find the constructed aggregates to be more reliable than their components, they still have high standard errors. I exploit the suggestion concerning the low confidence on point estimates of IC indicators by giving each individual country observation, under each category, a score between 1 (best) and 5 (poor) by visually inspecting the distribution. These ordinals were then added up to form an equally weighted aggregate measure (“weakness of institutions”) of IC. This may, by construction, vary between 4 (for example, Estonia, Hungary and Poland) and 20. The highest sum was recorded for Belarus (19), followed by Kazakhstan and Russia with a score of 17. Given that these ordinals fall as the quality rises, the variable is labelled *DIC* (decrease in institutional capital). The procedure

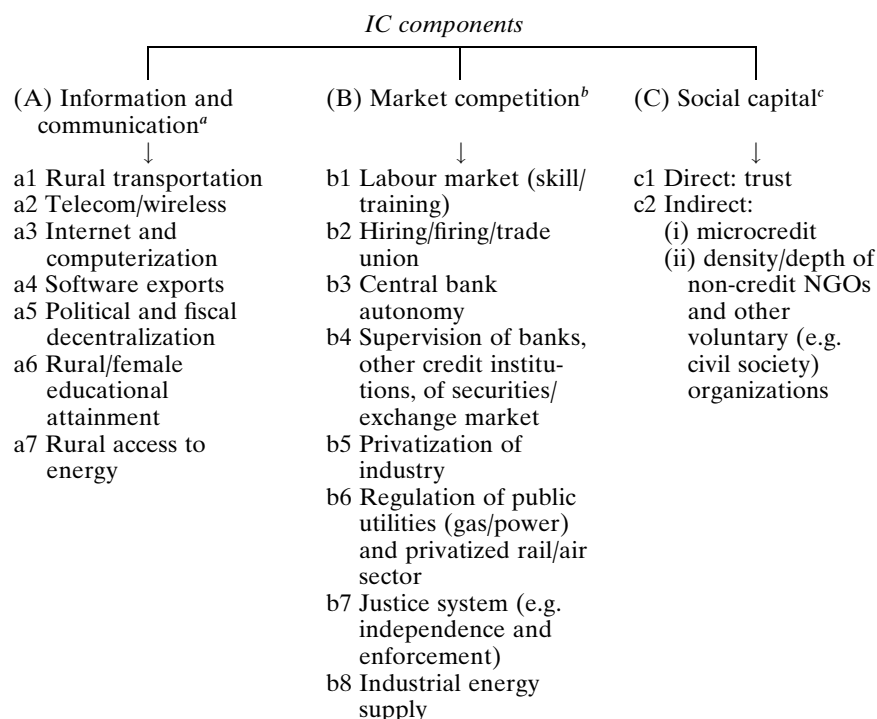


Figure 2.1 Institutional capital schema

Notes: *a.* non-exhaustive list; *b.* overlap (but no inconsistency) both within and between categories; *c.* precise indicators to be chosen would depend on data availability.

of using four aggregate indicators to compile an overall IC index should help approximate the general position of the country better.

4.5 Operationalization of non-income poverty

Recall here that I would ideally like to measure the output of the economic game that has a bearing on poverty over and above the income/consumption aspects. In terms of the capability approach, I note that voice and freedom are hard to quantify, but access to inputs and information is consistent with the goal of maximizing capabilities.²⁴ Consequently, I focus on female literacy; the health status of the very young, particularly infant mortality and birth weight; and longevity. Literacy and child (or maternity) health developments may result from deliberate

public policy and formal rules of society (for example, compulsory attendance in school to a certain age or widely available rural health facilities). Or they may derive from civil and public varieties of social capital (social support and networking), or a combination of both formal and informal institutions. In any event, it may be noted that the elements cited above indicate the outcome on the human capital side, and thus the physical capital accomplishment is neglected in this construction. Although it is not difficult to provide a conceptual measure of the physical capital accomplishment (say, the interest rate differential between rural credit and the commercial sector lending rate), observability is the dominant constraint.

4.6 Comparable dataset

The task here is to compile a comparable dataset for the sample countries. The DIC and NIP components have been reviewed above; the remaining data relate to GDP growth and poverty/inequality measures (based on household surveys). As noted, the poverty/inequality measures are obtained from the poverty-monitoring project at the World Bank, which was initially compiled by Chen and Ravallion (2000) and is accessible to all (World Bank, 2001a). Although the present study covers the post-liberalization period (namely, 1988–1998/99), it is necessary to have observations at the pre-transition stage (as of 1987/88 say) and that capture the fuller effects of reforms, as of 1998/99 say. The idea is to capture the “long-term” effects, there being the presumption of a lag structure. These considerations restrict my sample to 14 countries, except that in the case of Romania I have no poverty data beyond 1994.²⁵ Hence some of my results are based on a smaller sample of 13 countries.

5 Empirical evidence

Before focusing on the poverty results, I shall briefly outline the empirical observations that this limited dataset may permit on issues such as the process of growth, inequality and the evolution of institutions.

5.1 Growth

Annualized GDP growth rates (see table 2A.2, column 2, in the appendix) show that, over the reference period 1990–1999, EEFSU average growth was negative – the only region to have this distinction. Of the countries included in the sample, Hungary, Poland and the Slovak Republic alone recorded positive growth, which was robust only in the case

of Poland (at 4.5 per cent per annum). This subgroup happens to comprise the countries that had different histories going into the command economy compared with the rest of the sample.

Ivaschenko (2001) notes that the pace of deindustrialization was a significant feature of the recent economic history of the region. Data from *World Development Indicators 2001* (World Bank, 2001b) reveal that the overall industrial decline was at an annual rate of 6.6 per cent over the 1990s for the group of countries under consideration here. Of these, Kazakhstan, Moldova and Ukraine recorded the worst industrial decline (14 per cent annual average), and these were indeed the countries where output decline was the steepest (annual average of 9.2 per cent). Agricultural loss, although less steep, was more uniformly distributed vis-à-vis the overall GDP decline.

Growth hypotheses

Can this body of data tell us anything about the growth process? Does the initial level of inequality (*IIQ*) affect growth in the tradition of the evidence compiled, among others, by Alesina and Rodrik (1994)? The present sample does not support any role for the initial (i.e. 1988/89) level of inequality in the growth performance over the period 1990–1999. Ordinarily, we would expect initial inequality, given the very imperfect market for both capital and human capital in the transition countries, to make a difference to the opportunities available. This is the thrust of the evidence that has gained a lot of attention in modern growth theory. I believe that in the present context the 10-year horizon is too short to address that issue. Second, like many authors I also use income/expenditure data in the absence of data on wealth distribution. The extent to which income data tracked the initial wealth distribution for the EEFSU region is unknown.

Indeed, the only variables that appear to explain GDP growth to a significant extent are the quality of institutions (*DIC*) and the dummy (*DUM*). As explained earlier, I created a dummy variable to distinguish the EEFSU countries according to whether they had market institutions before communism ($DUM = 1$) or not ($DUM = 0$). I believe that the dummy also tracks the evolution of institutions in these countries, and indeed these two variables (*DIC* and *DUM*) are highly correlated (significant at the 1 per cent level), thus preventing us from entering both as independent variables owing to possible multicollinearity. Regressing growth on potentially plausible variables (recall hypotheses P1 and P2) yields the results reported in table 2.1. All regressions reported here utilize ordinary least squares procedures.

Thus we find that a weakening of the institutional capital leads to a decrease in the growth rate, whereas experience with market institutions

Table 2.1 Explaining GDP growth

Independent variable	Equation					
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	2.55 (1.18) ^h (1.47) ^h -0.54 (-3.06) ^h (-3.45) ^h	-7.02 (-5.47)	3.9 (1.77) (2.53) ^h -0.49 (-2.85) (-4.13) ^h	-5.18 (-2.59)	-9.12 (-4.63) (-6.14) ^h	-6.56 (-2.80) (-4.42) ^h
<i>DIC</i>						
<i>DUM</i>				5.55 (3.14)		
<i>COC</i>		6.23 (3.67)			0.13 (3.23) (4.34) ^h	0.12 (3.12) (4.94) ^h
<i>RIQ</i>			-0.22 (-1.60) (-1.84) ^h	-0.16 (-1.18)		-0.23 (-1.74) (-2.31) ^h
Residual <i>df</i>	12	12	11	11	12	11
<i>R</i> ²	.44	.53	.55	.58	.46	.58
<i>F</i> -value	9.36	13.58	6.58	7.67	10.4	7.58
Overall significance (<i>p</i>)	.01	.00	.01	.01	.01	.01

Source: Estimation by the author using data described in the appendix.

Note: The *t*-values are given in parentheses. The second set of *t*-values superscripted by “h” captures the effect of correcting for heteroscedasticity.

in an earlier epoch increases the growth rate very significantly. These indications are entirely consistent with the tenets of NIE, which suggests that, where markets are incomplete, informal institutions such as social capital would have an important role to play in making both personal and market exchanges possible. Such a finding, even if preliminary, is an interesting vindication of my hypothesis.

A modest role is evident for distributional change (*RIQ*), namely that rising inequality (which has been very dramatic for many of these countries) dampens growth.²⁶ The causal process is not entirely evident from this observation, given that transition scholars view labour market policies as responsible for the rise in earnings inequality. Although this is not well documented, I view capital market inadequacies, namely credit shortages, as another potential source of discontent.

Table 2.1 also reports the *t*-values for some of the key equations corrected for heteroscedasticity. As one might expect, all the *t*-values are higher, and the *RIQ* variable is close to being significant at the 10 per cent level in equation (3). The principal change of interpretation, however, relates only to equation (6), which I discuss below.

Although both equations (3) and (4) appear to fit the data well (R^2 of .55 and .58, respectively), there seems to be little to choose between them. Indeed, taking equation (3) as a benchmark allows a more immediate policy discussion than if we wonder about the course of history. History surely mattered, but to improve matters one needs to get on with the task of building institutions. I should emphasize that, whereas Dollar and Kraay (2002) find mild support for the role of the “rule of law”, I find a rather robust coefficient for the much broader variable, institutional capital, in promoting growth. Moreover, rising inequality appears to have an independent (constraining) effect on growth (though the statistical significance is weaker).

5.2 Explaining the rise in inequality

Because these economies were very much in transition, causing great dislocation in the economic lives of their citizens, the context matches, perhaps too dramatically, the early modernization phase envisaged by Kuznets. Has the underlying growth contributed to the rampant rise in inequality? Estimating the above relationship we have:

$$RIQ = 6.56 - 0.69GRO \quad R^2 = .21 \{F = 3.15; p = .1\} \quad (2.5) \\ (3.1) \quad (-1.77)$$

Contrary to the early phase of the Kuznets process, the relationship is negative; that is, growth seems to dampen the rise in inequality, although the coefficient is not highly significant. To the extent that the quintile

measure (namely the share of income accruing to the poorest quintile) used by Dollar and Kraay (2002) is related to the Gini coefficient, they find no systematic effect of growth on inequality.²⁷ Qualitatively, my result is not much different. Plausibly the dislocations due to the massive loss of jobs and high internal migration (frequently from urban to rural areas) may have caused too much turbulence to allow stable behaviour of the type in the standard view of early industrialization. Adding more variables does not improve matters. However, I should point out that public transfers (typically pensions) might in principle greatly mitigate the market-determined inequality in earnings. To the extent that household survey data include transfers, there is evidence that pensions were highly skewed (in favour of the better off) in most EEFSU countries, although the level of the transfers varied greatly from one country to another (Raiser, 2001).

5.3 *Institutional capital and path dependence*

Can we explain the evolution of institutional capital itself, a key variable in the present study? My review of the concept would lead one to suppose that, since these institutions take a very long time to get to where they are today, the path of the evolution (i.e. history) should matter. Following hypothesis P7, I regress the *DIC* variable on this dummy and obtain a near-perfect fit:

$$DIC = 16.17 - 8.92(DUM) \quad R^2 = .73 \{F = 31.97; p = .00\} \quad (2.6) \\ (13.56)(-5.65)$$

Even though the sample is small, I find it remarkable that, as we move from FSU republics to Eastern Europe (including the Baltic states), the level of institutional capital rises in a dramatic fashion. This may be taken as another demonstration of the role of history.

5.4 *Explaining income poverty*

Poverty performance

I focus here on the income poverty figures based on the World Bank guide of US\$1 or US\$2 a day. Appendix table 2A.1 presents the basic data, and summary figures are derived in table 2A.2. It is clear that at the lower level there is virtually no poverty in most of the sample countries, except for some important cases where even this low-threshold poverty worsened persistently throughout the 1990s (especially Moldova and Russia). At the higher level (US\$2/day), significant poverty persisted in all but a few cases (namely Belarus, Poland and the Slovak Republic). The high variability (the standard deviation of 11.28 is close to the mean

of 12) in the figures for the 13 countries for which I have data over the longer period is striking. I note in principle that the relative prices (of non-tradables) can vary a great deal among countries, and hence the US\$2.15/day (in 1993 international prices and converted to purchasing power parity) need not adequately describe the underlying differences in poverty among countries. For the present group, however, such anomalies are unlikely to be serious. Hence, compared with the sample average of 12 per cent, the high (US\$2) poverty figures for Moldova (38.4 per cent) and Ukraine (45.7 per cent in 1999) remain a matter of concern.

Examining poverty data early in the transition phase reveals that the proportion of the population living below US\$1/day increased from 0 to about 10 per cent on average for the sample, but by the end of the 1990s most of these figures had become negligible except for Moldova and Russia, as noted above. The US\$2 poverty rate had likewise gone up from a negligible fraction to a median figure of about 20 per cent by 1993, but the worst records were found in Kazakhstan, Kyrgyz Republic and Lithuania. The estimation results I describe below pertain to the US\$2 poverty measure over the period 1988–1998. Table 2.1 summarizes the main equations.

Dominance of the growth variable

Equations (1) and (4)–(6) all have *GRO* as an explanatory variable. The coefficient is highly significant in each case. It is of interest to compare the present result of the importance of growth, obtained largely in a regime of negative growth, with the corresponding estimates in the literature, which mostly deal with more diverse growth histories. Let me first observe that the above finding is indeed consistent with the well-known results of Dollar and Kraay (2002) and Ravallion (2001). Using panel data covering the past four decades for 80 countries (developed and developing), Dollar–Kraay found a proportionate relationship between per capita GDP and the income accruing to the poorest quintile, even though there is considerable variation around the average relationship. Note that distributionally neutral growth still reduces absolute (for example, head-count) poverty. Ravallion (2001) uses US\$1/day poverty data for 47 developing countries over the 1980s and 1990s, and discovers that the growth elasticity of poverty is fairly robust. Ravallion’s growth coefficient of $(-)2.5$ (t -value of 8.3) may be interpreted as suggesting that “for every one per cent increase in the mean, the proportion of the population living below \$1/day ... falls by an average of 2.5 per cent” (2001: 8).

What is perhaps striking is that, for a sample of 13 countries, I get similar and almost equally robust results for the EEFSU region. The coefficient for the US\$2 poverty is of the same order as that found by Ravallion and other authors.²⁸ In my case, the poverty elasticity of growth is -2.71 ($t = -5.05$), reduced slightly to -2.66 ($t = -4.65$) when I net out

the effect of initial inequality, IIQ (compare equations (1) and (5) in table 2.2). Given the average contraction of 3.5 per cent, the growth coefficient cited above suggests that, if policy reforms fully reversed the contraction (producing zero growth of output on average), the share of the population below the US\$2 poverty line would have fallen from the average figure of 12.0 per cent to 2.6 per cent. This is a dramatic decline.²⁹ This observation is also consistent with the specific experiences of the few countries that registered positive growth over this period. Hungary, which grew at an annual average rate of 1 per cent over the period, still recorded a rise in the (US\$2) poverty rate from nearly 0 to 7.3 per cent. Poland, which grew at 4.5 per cent, was able to eliminate almost all poverty (which had reached double digit rates in the early 1990s). For Moldova and Ukraine, the very severe contraction (nearly 11 per cent per annum over the decade) caused a huge rise in poverty (38 and 46 per cent, respectively). Hence Ravallion's suggestion that "there is no sign that distributional changes help protect the poor during contractions" (2001: 9) appears to be confirmed by the EEFSU data.

Inequality and poverty

Previous research has shown that, even though growth and absolute poverty reduction go hand in hand, the share of income going to the poor (however defined) remains largely independent of the growth rate of GDP. Given initial inequality, this means that the rich (say the top quintile or so) gain more than the poor, on a per capita basis, from the incremental output resulting from growth. The IIQ variable does yield the correct sign in my regressions, but the coefficients are not statistically significant for the actual sample, perhaps owing to its small size. Given the a priori reasonableness of a role for income inequality, I report the result inclusive of IIQ in equations (4) and (5). When netted out of inequality effects, the poverty elasticity declines. Bourguignon's derivation suggests that the absolute value of the elasticity should rise with income growth while decreasing with inequality. Comparing equations (1) and (5) confirms these predictions. Ravallion (2001) also found that rising inequality dampens the poverty performance of growth.³⁰

Although, in my dataset, the initial inequality (as of 1987/88) was approximately uniform (an average Gini coefficient of 23.5 and s.d. of 1.63), unlike other regional data, inequality by the end of the 1990s had increased by an average of 9 percentage points, reaching a figure of 32.4. With increased inequality, the poor's share of income must have declined commensurately. However, if I replace the initial inequality measure (IIQ) with the actual change in inequality (RIQ), the results get even weaker.³¹ Looking at specific cases, we see that Russia, with the steepest rise in inequality, registered a large increase in its poverty rate. In contrast, Estonia witnessed a sharp rise in inequality (worse than in Moldova

or Ukraine) but avoided a large increase in poverty owing to its robust growth in the late 1990s. Hence the growth–RIQ interface, given the limited observations here, suggests that high inequality might plausibly constrain growth (see table 2.1, equations (3) and (6)), and thus lead to a worsening of poverty, but has little independent effect once the growth effect has been taken into account.

Institutions and poverty

Previous empirical studies generally failed to detect any discernible impact of institutions on poverty, or indeed of elements such as the openness of the economy, which might be viewed as growth friendly. Dollar and Kraay (2001) find a negligible correlation between changes in inequality and greater openness. It is of interest therefore to note that, in the present study, the *quality of institutions* does matter. It appears to worsen the poverty picture, but the robustness of the estimate is less than stellar ($t = 1.85$ in equation (2) in table 2.2).

Unfortunately, the correlation between *DIC* and *GRO* affects the estimation. Examining the bivariate correlation among the set of potential explanatory variables, I found that the correlation coefficient between *GRO/DIC* is $-.66$, and that between *GRO/DUM* is $.73$, and of course the figure is $-.85$ between *DIC/DUM*. All these coefficients are significant (two-tailed) at the 1 per cent level. Consequently, I do not use both *DIC* and *DUM* as right-hand-side variables. Even *GRO/DIC* together in equations (4) and (6) in table 2.2 creates a problem. The *DIC* variable undergoes a change of sign when *GRO* is also present in the equation, which is counter-intuitive (though the coefficient is not statistically significant). The problem is exacerbated if one uses *GRO/DUM* together as an explanatory variable in examining the poverty outcome. The primary reason for reporting them is to draw attention to the fact that the impact of the variables of potential interest, namely *GRO*, *DIC* and *IIQ*, as represented in equations (4)–(6), do represent the net effect of each of these variables; i.e. holding the other variables constant.

The broad conclusion on the behaviour of income poverty must be that growth largely drives poverty reduction. Although the quality of institutions and the rise in inequality during growth materially affect poverty reduction, there is little additional explanatory power in these independent variables once growth is taken into account. The above sentiment is much as in Dollar and Kraay (2002).

5.5 Non-income poverty

I focus on four indicators of non-income poverty (NIP), namely life expectancy, infant mortality, female primary enrolment and the incidence of low birth-weight babies. Table 2A.3 in the appendix provides a

Table 2.2 Income poverty increase in the EEFSU, 1988–1998

Independent variable	Equation						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	4.57 (1.50) (1.77) ^h	0.53 (0.06) (0.10) ^h	22.98 (4.47) (3.65) ^h	8.27 (1.45)	4.75 (1.49) (1.93) ^h	9.31 (1.51)	30.27 (4.11) (3.69) ^h
<i>GRO</i>	-2.71 (-5.05) (-5.58) ^h			-3.11 (-4.10) (-4.50) ^h	-2.66 (-4.65) (-5.27) ^h	-3.12 (-3.97)	
<i>DIC</i>		1.28 (1.85) (1.85) ^h		-0.48 (-0.77) (-0.86) ^h		-0.57 (-0.87)	
<i>DUM</i>			-15.81 (-2.25) (-2.33) ^h				
<i>IIQ</i>					0.60 (0.40) (0.59) ^h	0.94 (0.59)	
<i>COC</i>							-0.36 (-2.42) (-2.79) ^h
Residual df	11	11	11	10	10	9	11
<i>R</i> ²	.70	.24	.32	.72	.70	.73	.35
<i>F</i> -value	25.5	3.41	5.08	12.56	11.83	7.95	5.85
Overall significance (<i>p</i>)	.00	.09	.05	.00	.00	.01	.03

Source: Estimation by the author using data described in the appendix.

Note: The *t*-values are given in parentheses. The second set of *t*-values superscripted by ‘h’ captures the effect of correcting for heteroscedasticity.

summary of the performance of the sample countries over the reference period. On female primary enrolment, note that there has been sizeable advance in all countries. Judging by the incidence of low birth-weight babies, the Baltic countries boast the best record (4 per cent, which is well below the regional average of 7 per cent). Turning to infant mortality figures, again there has been a general reduction, although the regional average is rather high. For my empirical analysis, I devised a composite index of NIP that in effect accords equal weight to the four components cited here. Table 2A.3 displays the aggregate index of NIP and describes the methodology involved.

Analysing NIP, we see that neither GDP growth nor the rise in inequality (*RIQ*) is successful in the explanation (table 2.3).³² Interestingly, however, the *DIC* and *IIQ* variables, both individually as well as jointly, were able to explain the performance of EEFSU countries in eradicating non-income poverty. Indeed, non-income poverty got worse with the decline in the institutional capital, as well as with the more unequal initial income distribution. I do not know of any previous studies that document this sort of evidence.

The relevance of institutional capital is quite obvious; elements such as effective control of corruption, rule of law or public accountability do make for greater access to public resources (in health, education and infrastructure) for all citizens. Lower initial inequality also plays a similar role; it serves to complement the available public resources. Correspondingly, where public facilities are inadequate, personal wealth becomes indispensable, thus causing disparities in access to physical and human capital. Interestingly, *DIC* and *IIQ* are not much correlated, so they reinforce each other in their effects to reduce NIP. This is precisely what equations (1), (2) and (4) demonstrate in table 2.3, where I report the estimated coefficient for the growth variable, which is insignificant, for reference only.³³

The importance of the *IIQ* variable is intriguing. The growth literature suggests that greater initial equality should allow faster growth. I do not find evidence that greater equality significantly affects growth, nor do I find that growth itself affects NIP. Greater initial equality, however, directly leads to non-income poverty gains. This is in sharp contrast to the behaviour of income poverty, where additional variables (such as *DIC*) failed to exert an independent effect beyond influencing growth.

5.6 A closer look at institutional capital

Given its central role in the estimation results, it would be useful to examine the *DIC* variable more closely. Presently, all four *DIC* components appear to be mutually correlated, which prevents me from estimating the separate effects of a subset of these components controlling for each

Table 2.3 Explaining non-income poverty

Independent variable	Equation						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	67.70 (3.90) (5.44) ^h	28.32 (3.82) (4.11) ^h	11.83 (0.97)	58.27 (3.55) (5.54) ^h	34.79 (3.07) (4.04) ^h 1.77 (0.86) (1.53) ^h	-10.94 (-0.72) (-0.82) ^h	-2.64 (-0.18) (-0.26) ^h
<i>GRO</i>							
<i>DIC</i>	-3.53 (-2.48) (-2.81) ^h			-2.70 (-2.00) (-2.73) ^h			
<i>DUM</i>			29.42 (1.82)				
<i>IIQ</i>		-11.44 (-2.42) (-2.83) ^h		-8.61 (-1.93) (-2.56) ^h			-7.89 (-1.83) (-2.80) ^h
<i>COC</i>						0.90 (2.92) (3.65) ^h	0.71 (2.35) (3.80) ^h
Residual df	12	12	12	11	12	12	11
<i>R</i> ²	.34	.33	.22	.51	.06	.42	.55
<i>F</i> -value	6.2	5.9	3.3	5.7	0.7	8.54	6.79
Overall significance	.03	.03	.09	.02	.41	.01	.01

Source: Estimation by the author using data described in the appendix.

Note: The *t*-values are given in parentheses. The second set of *t*-values superscripted by “h” captures the effect of correcting for heteroscedasticity.

other. Perhaps one should look for alternative indicators, indeed instruments, that are not so highly correlated with each other (and vis-à-vis other explanatory variables) and thus allow independent coefficient estimates. From a policy perspective, this would appear to be an urgent research agenda.

Within the present limitations, it nevertheless turns out that some disaggregation may be revealing. Control of corruption (COC) is seen as the single most significant factor in the present context, though “rule of law”, “voice and accountability” and “lack of violence”, taken one at a time, also have explanatory power in one or more equations. I pursue this systematically, and examine whether replacing the aggregate *DIC* by *COC* (or other components) yields interesting new insights into the behaviour analysed above. The outcome is presented in equations (5)–(6) in table 2.1, equation (7) in table 2.2 and equations (6)–(7) in table 2.3.

Looking at the growth equations (table 2.1), it turns out that replacing *DIC* by *COC* in equations (1) and (3) yields an improvement in the results. Importantly, the addition of *RIQ* gives more precise coefficient estimates for both independent variables, especially if we focus on the heteroscedasticity corrected errors (compare equations (3), (5) and (6)). Although not reported in the table, if we replace the rule of law instead of *DIC*, the results are a little weaker, though they remain significant.³⁴ This is consistent with the Dollar–Kraay findings, though they apparently did not try the corruption variable.

When it comes to explaining income poverty (table 2.2, equation (7)), again at a disaggregate level, *COC* did best among all *DIC* elements, followed by “lack of violence”. Given the strong correlation between growth and *DIC* components, I was not able to estimate a multiple regression equation. Both “corruption control” and “voice and accountability” were ahead of others in explaining non-income poverty, though *COC* was the clear front-runner. Replacing *DIC* by *COC* in equations (1) and (4) in table 2.3 yields sharper results. Indeed, this substitution leads to more precise coefficient estimates for both independent variables (compare equations (4)–(7)), again using heteroscedasticity corrected errors.

Thus we find that each of the four components of the institutional capital variable has an important role to play, though control of corruption is the most significant. Raiser reviewed evidence on the extent of bribes, unofficial levies and criminal activities encouraged by the bureaucracy to facilitate various permits needed to set up and run private enterprises in Ukraine and Russia (2001: 229–232). I believe that a deeper investigation into additional variables (beyond the four included in the present construction) in a richer dataset (i.e. a larger set of countries) would be extremely useful from a policy perspective.

To recap the above discussion, we observe that the transition from the

communist system to hybrids of market institutions has led to the challenge of adaptation to the new mode of doing business. Some nations were better prepared, owing to their earlier experience with the market, especially those that were able to retain the vestiges of informal institutions commensurate with the market (and intuition about them). Hence the manner in which institutional capital has been fashioned over the past decade or so provides the dominant explanation behind the growth process and, in its wake, the poverty dynamics both in income (albeit indirectly via growth) and in non-income dimensions. Indeed, it is in the non-income dimensions where this effect has been most dramatic, overshadowing other plausible phenomena.

6 Conclusion

This chapter set three primary goals. The first was to review the EEFSU growth experience (1988–1998/99) for the sample of 14 countries, and to attempt to discern the extent to which the quality of institutions affected economic growth and poverty. This was to be carried out in terms of the stylized hypotheses of the growth–poverty–inequality nexus depicted above (section 2), where I built in an emphasis on institutional capital. Second, I wanted to test a closely related hypothesis of path dependence in the evolution of institutions, especially of the informal variety. Because informal institutions are slow to evolve, the path dependence hypothesis suggests that current growth and poverty outcomes will differ between the East European countries (including the Baltic states) and the FSU countries, even though they may all have endorsed the market economy and moved towards a participatory polity. Finally, I also wished to focus on the observed record along the non-income dimensions of poverty, and to examine the differences between countries in terms of the underlying institutional capital and economic growth.

My key findings, interim as these are, may be restated very briefly. The institutional variable appears to have a very emphatic role in explaining growth, while at the same time rising inequality may dampen growth. Like most researchers on the topic, I find growth alone has overwhelming importance in influencing income poverty reduction. Measurement difficulties prevent me from testing for the independent role of institutional capital in this process. When it comes to non-income poverty, however, economic growth does not figure at all in the explanation. Institutional capital plays the primary role, though an independent role for initial income inequality also appears to be robust.

How do these findings relate to existing results in the literature? The literature provides little direct evidence on broader measures of institu-

tional capital, especially as they relate to the issues of poverty and inequality. However, there have been attempts to address selected aspects of the phenomenon, chiefly democratization, rule of law and corruption. Closest perhaps to my interests is the finding by Dollar and Kraay (2002) that “rule of law” had a positive impact on growth. I experimented with several indicators of institutional capital and found the corruption variable to yield more precise estimators. Somewhat further afield, Persson (2002) examined the effects of democracy on the fiscal outcome (for example, the size of the public sector and the nature of fiscal interventions). Rodrik (2000) finds that the extent of political participation (as measured by political rights and civil liberties) makes for a more stable pattern (i.e. reduced volatility) of output growth. In terms of non-income poverty, mine appears to be the first effort to explain this behaviour empirically.

What does the present analysis suggest for the direction of future policy insofar as poverty reduction strategies are concerned? The essential point is surely to harness greater growth. This study stresses the potential importance of the quality of institutions in fostering growth, which is empirically supported by the EEFSU data. The spectre of rising inequality choking off growth also appears very real. To the extent that rising income inequality is due to low labour force participation, the policy implications are clear. A host of worker training incentives (for example via the tax system) targeted at skill acquisition, especially by young adults, would be a key feature. This is well recognized, though functional models of low-cost/high-demand programmes may be scarce in the transition world as elsewhere. The design of well-targeted and sustainable public transfer schemes (for example, social insurance) is another challenge that one faces everywhere.

As far as non-income poverty is concerned, the focus again is squarely on the institutional factors (as well as initial inequality). Policy interventions such as the promotion of self-employment (say via group-based micro-lending) may directly lead to income generation (and thus help fight income poverty). However, the very act of group formation is widely believed to permit group members greater access and more effective utilization of the available social capital in the community. The latter externality is believed to lead to advances in non-income dimensions of poverty (for example, health, sanitation, literacy and numeracy).³⁵ Of course, deliberate NGO–civil society initiatives in these areas, with or without the contrivance of microcredit, may also speed up these goals by allowing broader access to rural people, thus partly offsetting historical differences in initial conditions.

The sad point is that progress on the institutional front is lacking in many of these countries (as elsewhere), and progress here is essential both to ensure growth (and hence reduce income poverty) as well as to

ameliorate broader poverty. I have identified the control of corruption as perhaps the foremost indicator of institutional capital, possibly followed by the rule of law. Given my view of the institutional forces, such goals are not achievable unless countries strive for participatory rich democracies (with adequate political and fiscal decentralization) and adopt institutions compatible with competitive markets. However, the institutional story is still incomplete. The social capital idea tells us that cohesion and networking within communities may be fruitfully harnessed through NGO and civil society intermediation. Public authorities must therefore encourage free and unhindered initiatives by such organizations, which often appear efficient in the low-cost provision of goods and services that private markets alone are unable to allocate fully. Indeed, the authorities may go further and legislate provisions to strengthen the organizational foundations of NGOs by legitimizing their intermediation status, and requiring them to follow adequate accounting principles (via credible audit regimes).

Appendix

Table 2A.1 Income poverty (US\$2/day), 1993 PPP prices

Country	Mean income, 1988 (US\$)	Inequality, 1988 (Gini coefficient)	Headcount poverty (per cent)				
			1987	1990	1993	1996	1998
Belarus	203	22.8	0.9 ^a	—	33.4	20.4 ^b	0.5
Bulgaria	315 ^c	23.3 ^c	0.0 ^c	1.1 ^d	1.3 ^e	7.8 ^b	21.9 ^f
Estonia	225	23.0	0.8 ^a	—	21.9	17.7 ^b	5.2
Hungary	212 ^c	23.3 ^c	0.4 ^c	—	4.0	—	7.3
Kazakhstan	196	25.7	2.3 ^a	—	41.7	15.3	—
Kyrgyz Rep.	181	26.0	0.0 ^a	—	44.5	—	17.9 ^f
Latvia	408	22.5	0.0 ^a	—	5.0	6.3 ^b	8.3
Lithuania	382	22.5	0.0 ^a	—	63.7	13.5 ^e	7.8 ^g
Moldova	325	24.1	0.2 ^a	—	31.9 ^d	—	38.4 ^f
Poland	216 ^h	25.5 ^h	1.1	1.8	10.5	—	<2.0
Romania	191 ^c	23.3 ^c	2.1 ^c	7.8 ^d	27.5 ^e	—	—
Russian Fed.	286	23.8	0.3 ^a	—	19.6	24.4	25.1
Slovak Rep.	232	19.5	0.3	1.7 ^d	0.5 ⁱ	—	0.0
Ukraine	310	23.3	0.3 ^a	1.7 ^d	14.7 ^b	23.7	45.7 ^j

Source: World Bank (2001a); World Bank (2001b: table 2.6).

Notes:

- a. 1988. f. 1997.
- b. 1995. g. 1996.
- c. 1989. h. 1987.
- d. 1992. i. 1993.
- e. 1994. j. 1999.

Table 2A.2 Poverty profile during transition

Country	GDP growth, 1990–1999	Change in inequality, 1988–1998	Change in poverty (US\$1/day) (% points)		Change in poverty (US\$2/day) (% points)	
			1988–1993	1988–1998	1988–1993	1988–1998
Belarus	-3.0	-1.1	1.1	0.0	32.5	-0.4
Bulgaria	-2.7	5.0 ^a	0.0 ^b	2.0 ^c	1.3 ^b	21.9 ^c
Estonia	-1.3	12.4 ^d	3.2	2.0	21.1	4.4
Hungary	1.0	7.5 ^e	0.0 ^f	0.0 ^g	3.6 ^f	6.9 ^g
Kazakhstan	-5.9	9.7 ^h	1.0	1.4 ^h	39.4	13.0 ^h
Kyrgyz Rep.	-5.4	15.0 ⁱ	23.0	1.6 ⁱ	44.5	17.9 ⁱ
Latvia	-4.8	9.9	0.0	0.2	5.0	8.3
Lithuania	-4.0	9.9	16.5	0.0 ^h	63.7	7.8 ^h
Moldova	-11.0	10.3 ^j	7.3 ^j	11.3 ⁱ	31.7 ^j	38.2 ⁱ
Poland	4.5	-2.3 ^k	5.4 ^k	2.0 ^l	9.4 ^k	0.9
Romania	-0.8	4.9 ^b	2.8 ^b	—	25.4 ^b	—
Russian Fed.	-6.1	24.9	6.2	7.1	19.3	24.8
Slovak Rep.	1.8	9.7 ^m	0.0 ^k	0.0	0.5 ^k	0.0
Ukraine	-10.7	9.2 ^e	0.0 ^j	2.9 ⁿ	1.4 ^j	45.4 ⁿ

Source: Author's calculation based on table 2A.1 and World Bank (2001b: table 2.6).

Notes:

- a.* 1989–1995. *h.* 1988–1996.
b. 1989–1994. *i.* 1988–1997.
c. 1989–1997. *j.* 1988–1992.
d. 1988–1995. *k.* 1987–1993.
e. 1989–1996. *l.* 1987–1998.
f. 1989–1993. *m.* 1988–1993.
g. 1989–1998. *n.* 1988–1999.

Table 2A.3 Non-income poverty indicators

Country	(1) Life expectancy, 1999 (years)	(2) Infant mortality (per '000)	(3) Female primary enrolment, 1997 (per cent)	(4) Low birth weight, 1992–1998 (per cent)	Aggregate index of non-income poverty ^b
Belarus	68	11	84	6	42
Bulgaria	71	14	91	7	29
Estonia	71	10	86	–	40
Hungary	71	8	96	8	47
Kazakhstan	65	22	–	9	–30
Kyrgyz Rep.	67	26	93	6	–10
Latvia	70	14	87	4	57
Lithuania	72	9	–	4	84
Moldova	67	17	–	5	36
Poland	73	9	94	8	43
Romania	69	20	95	10	–26
Russian Fed.	66	16	93	–	18
Slovak Rep.	73	8	–	–	56
Ukraine	67	14	–	8	15
Eastern Europe & Central Asia	69	21	92	7 ^a	0

Source: World Bank (2001b).

Notes:

a. Sample average.

b. The index is calculated with approximately equal weighting of all four components. Thus I scale up the figures in columns (2) and (4) by a factor of 4 and 11, respectively, so that these figures come on average to 80, which is the average for columns (1) and (3). For missing data I have used the regional or the sample average as available.

Table 2A.4 Indicators of institutional capital

Country	Indicators ^a				Sum of the ordinal ^b
	Corruption control	Rule of law	Lack of violence	Voice and accountability	
Belarus	26 (4)	18 (5)	34 (5)	35 (5)	19
Bulgaria	30 (4)	47 (3)	67 (2)	69 (2)	11
Estonia	78 (1)	69 (1)	78 (1)	75 (1)	4
Hungary	79 (1)	74 (1)	88 (1)	85 (1)	4
Kazakhstan	14 (5)	30 (4)	59 (3)	26 (5)	17
Kyrgyz Rep.	24 (4)	34 (4)	62 (3)	43 (4)	15
Latvia	49 (2)	60 (2)	68 (2)	70 (2)	8
Lithuania	63 (1)	61 (2)	61 (3)	71 (2)	8
Moldova	40 (3)	52 (3)	42 (4)	61 (3)	13
Poland	70 (1)	70 (1)	80 (1)	81 (1)	4
Romania	38 (3)	51 (3)	51 (4)	64 (3)	13
Russian Fed.	27 (4)	26 (4)	23 (5)	41 (4)	17
Slovak Rep.	63 (1)	59 (2)	73 (1)	72 (2)	6
Ukraine	12 (5)	27 (4)	41 (4)	53 (3)	16
EEFSU	34 (3)	42 (3)	47 (4)	49 (4)	14

Source: The entries in columns 2–5 are based on data given on the WBI website on governance (World Bank, 2001c).

Notes:

- a.* The figures in brackets are ranks accorded to the country record on a scale of 1 to 5: a score below 20 was assigned the bottom position of 5, 21–30 was ranked 4; 31–45 was ranked 3; 46–55 was ranked 2; a score above 56 secured the top position of unity.
- b.* This column adds up the ordinal ranks of the indicators.

Notes

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1. Coase (1984) attributes the origin of the term “new institutional economics” to Oliver Williamson.
2. The essential methodology behind the selection of countries is that comparable poverty data exist for the entire set. I therefore selected 14 countries from EEFSU that had a comparable measure of initial inequality (say as of 1988). The Gini coefficient generally varied between 0.20 and 0.26.

3. See also Ravallion and Datt (1996) and Timmer (1997), among others.
4. What still remains unanswered is the process (for example, a set of policies) that gets rural non-farm production going. It may be sufficient that surplus agricultural income gives rise to strong demand for such goods. If this is true, the focus is then on how to get agriculture (i.e. primary sector production) moving. In contrast, no explanation is provided for the apparent stagnation of the urban sector. Whether it is excessive regulation, corruption, trade barriers or technological changes that bring this about needs to be examined.
5. However, one may interpret Kuznets' hypothesis as merely suggesting an empirical regularity, without necessarily being associated with a *unique* causal process. Clearly the rationalization of the Kuznets process, even if verifiably true over some time period, is ad hoc in nature. Also note that Kuznets' inequality refers to *all* sources of income (labour and capital).
6. In the FSU, Milanovic considers only Latvia and the Russian Federation. His results, which were largely substantiated by observed experience, are based on simulations of his model.
7. Note the heavy reliance on the fast-growing primary sector to sustain the RLI-led growth spurt. The question is, where does one find surplus labour in the EEFSU? From the former industrial sector? If so, the pace of deindustrialization may be viewed as causing poverty. However, Boeri (2001) insists that the rural sector continues to offer the last resort for discouraged workers. He argues that transfers from the state, as well as home production, provide the reservation wage.
8. Combining P1, P2 and P4 yields P4a. However, recall that I have also argued that IC directly affects income gains, especially for the poor.
9. See, for example, Besley and Coate (1995). Morduch (1999) provides a brief but expedient review of the theory.
10. If all agents perceive their personal gain from following a convention, then compliance would not require any monitoring.
11. The above point was well illustrated above with the example of property rights.
12. I may also record that Arrow (1970) had earlier talked about likely retrogression in the adaptation of social norms. However, Matthews' remark is general, and thus applies to all institutions.
13. He cites the abolition of slavery as an example of changes in preferences.
14. Many authors studying the privatization process in transition countries (for example, Russia) have likened it to a process of rent-seeking by elected officials by turning insiders and, often gangsters, into the new owners of former public entities (Raiser, 2001; Cornia and Popov, 2001).
15. Schotter's (1981) observation that *conventions* that actually emerge depend on history, and that different histories will lead to different conventions, appears analogous to North's theory of "path dependence", except that North refers to the totality of institutions not just to informal ones.
16. Chapter 1 of Cornia and Popov (2001) documents the pitfalls of the latter approach well.
17. The FGT index is given by $P_\alpha(z, x) = \int_0^z [(z - x)/z]^\alpha f(x) dx$, where α is a distribution sensitivity parameter.
18. Bourguignon measures inequality by the standard deviation (s.d.) of the logarithm of income, but switches to the Gini coefficient in empirical work for both the initial level and changes in levels because the Gini is an increasing function of s.d. In this chapter I use the Gini throughout.
19. Bourguignon has criticized the use of a naked "growth" term as an independent variable in an equation explaining poverty. He would rather have the theoretical elasticity

as a built-in multiplier in the manner of (2.2). My defence is essentially that I am not merely testing for the “identity check” behind (2.2). My principal hypothesis is embodied in (2.1). Second, even within the decomposition methodology outlined above, it would be presumptuous to impose a function as the logarithmic on a small sample size as I do (13 or 14 observations at this stage).

20. Surely, decentralization may also lead to better governance as well as to a strengthening of the social capital (of the public variety). Such overlaps are unavoidable.
21. For country case-studies, however, see the work on Russia by Hjoellund, Svendsen and Paldam (2001) and additional references cited therein.
22. Indeed, two papers by Kaufmann, Kraay and Zoido-Lobaton (1999a,b) elaborate on the ideas and methodology behind the selection.
23. I have left out of consideration the two remaining WBI indicators, namely, regulatory effectiveness and government effectiveness, for the simple reason that they appear a little too broad in scope.
24. See also Rodrik (2000).
25. The original sample of 14 countries consists of Belarus, Bulgaria, Estonia, Hungary, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Moldova, Poland, Romania, Russian Federation, Slovak Republic and Ukraine.
26. Adding more variables worsens the overall fit (as measured by the F -value and the implied level of significance).
27. Dollar and Kraay (2002) point out that, for the lognormal distribution, the two measures of inequality cited above are closely related, though in a non-linear fashion.
28. Of course the poverty line used here is the US\$2 level, while Ravallion and others have used US\$1/day. See Heltberg (2002) for a brief survey.
29. The dependent variable in the regression is the change in the percentage of people below the poverty line over the period 1988–1998. Thus a reversal of the contraction rate of 3.457 per cent throughout the decade would have caused poverty to decline by 9.4 percentage points. The average US\$2 poverty rate stood at 12.0 per cent in 1998/99.
30. There is some ambivalence as to the type of inequality measure one employs in an equation such as (5) in table 2.1 here. Analytical growth theory suggests that the initial wealth distribution provides the correct specification, which is what I follow. However, researchers using “spell” data (for example, Ravallion) appear to measure poverty, growth and income inequality all at the same point in time.
31. The results are not reported in the chapter.
32. The RIQ analysis is not reported in table 2.3.
33. Further, the correlation among $GRO/DIC/DUM$ vitiates the joint effects in multiple regressions. Thus the coefficient of growth becomes negative once the correlated variables are added to either equation (3) or (4).
34. However, the history of the evolution of institutions (as measured by the dummy) did poorly (though statistically significant) in explaining corruption behaviour compared with the aggregate measure of institutions, DIC ; see equation (6). The R^2 for the COC equation was .35, and for DIC the figure was .73.
35. See Morduch (1999) for a critical review of the arguments.

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3

Why is so little spent on educating the poor?

Tony Addison and Aminur Rahman

1 Introduction

If the poor are to benefit from economic growth, then they need the skills that are in growing demand and the capacity to raise their productivity as workers, smallholder farmers and micro-entrepreneurs. Educating poor people spreads the benefits of growth, aside from raising human development directly. And investment in the human capital of the poor raises growth itself.

Yet the poor seldom receive a satisfactory education. Too few poor children enter primary school, too many fail to complete their education and the quality of their schooling is often dismal. Girls, especially rural girls, are particularly disadvantaged. Their enrolment rates are lower and their dropout rates are higher than those of boys. An estimated 855 million adults – nearly one-sixth of humanity – are functionally illiterate, and 64 per cent of illiterates are women (UNICEF, 1999: 7; World Bank, 2001a).

Taking developing countries as a whole, there is insufficient investment in primary education despite its benefits for the poor and its public good characteristics. Government spending on primary education is too low, both absolutely and as a share of total public spending. Parents are often the main source of primary school funding, not the state (Ablo and Reinikka, 1998). In contrast, public subsidies are generally much higher to

secondary and tertiary education than to primary education – roughly 3 times as high for secondary education and 30 times as high for tertiary education (table 3.1). In consequence, the higher-income deciles benefit disproportionately from public spending on education: the share of the richest income quintile (28 per cent) is roughly double that of the poorest income quintile (13 per cent) across countries according to World Bank data (table 3.2).

Why do such inequalities in public spending prevail? We argue that the underlying cause of unequal public spending is that economic power and the associated wealth provide the affluent with a disproportionate influence over the political process, and therefore over expenditure allocations. In contrast, the poor lack the resources with which to lobby and they are less organized (the rural poor, given their number and limited resources, face a particularly severe collective action problem). Consequently they are less able to influence governments in their favour.

The structure of this chapter is as follows. Section 2 discusses the political economy of public spending, contrasting the median voter theorem (which predicts a redistributive pattern of spending) with that of interest group models (which can predict an inegalitarian pattern of spending). Section 3 provides an empirical framework for testing the determinants of unequal education spending, focusing on income distribution, ethnicity and conflict. Section 4 sets out the main empirical results, namely that high initial income inequality as well as other factors (most importantly violent conflict) skew public spending against primary education. Section 5 concludes that attempts to raise public spending on primary education will meet significant resistance from the wealthy, and that such opposition is very likely in highly unequal societies. Using primary education to reduce poverty will prove difficult to achieve unless high income inequality is addressed as well.

2 The political economy of public spending

The available evidence suggests that allocating public money to primary education is largely pro-poor (Li, Steele and Glewwe, 1999; van de Walle and Nead, 1995). Whereas the poor gain from primary education, it is higher-income groups that mainly gain from public spending in tertiary education. The reason is straightforward. Attainment and success in tertiary education require the successful completion of primary and secondary schooling, but many of the poor fail to complete even four years of primary schooling (the minimum necessary for functional literacy) let alone secondary education (Filmer, 1999). In India, for example, 82 per cent of children from the richest 20 per cent of households complete

Table 3.1 Unit education subsidies by level in selected African countries

Country, year	Monetary unit	Primary	Secondary	Secondary as ratio of primary	Tertiary	Tertiary as ratio of primary
Côte d'Ivoire, 1995	CFAF	64,840	117,462	1.8	348,453	5.4
Ghana, 1992	cedi	24,824	65,275	2.6	392,707	15.8
Guinea, 1994	GNF	47,625	116,812	2.5	2,595,705	54.5
Kenya, 1992/3	KSh	1,368	3,868	2.8	42,050	30.7
Madagascar, 1994	FMG	50,504	192,491	3.8	1,140,000	22.6
Malawi, 1994/5	kwacha	220	909	4.1	15,523	70.6
South Africa, 1994	DBSA	1,124	2,055	1.8	5,657	5.0
Tanzania, 1993/4	TSh	6,600	7,500	1.1	n.a.	n.a.
Uganda, 1992/3	USh	11,667	37,352	3.2	373,525	32.0

Source: Castro-Leal et al. (1999: 63).

Note: n.a. = not available.

Table 3.2 Public spending on education by income quintile in selected developing countries, various years (per cent)

Country	Year	Quintile				
		1 (poorest)	2	3	4	5 (richest)
Armenia	1996	7	17	22	25	29
Côte d'Ivoire	1995	14	17	17	17	35
Ecuador	1998	11	16	21	27	26
Ghana	1992	16	21	21	21	21
Guinea ^a	1994	9	13	21	30	27
Jamaica	1992	18	19	20	21	22
Kazakhstan	1996	8	16	23	27	26
Kenya	1992/3	17	20	21	22	21
Kyrgyz Rep.	1993	14	17	18	24	27
Madagascar	1993/4	8	15	14	21	41
Malawi	1994/5	16	19	20	20	25
Morocco	1998/9	12	17	23	24	24
Nepal	1996	11	12	14	18	46
Nicaragua	1993	9	12	16	24	40
Pakistan	1991	14	17	19	21	29
Panama	1997	20	19	20	24	18
Peru	1994	15	19	22	23	22
Romania	1994	24	22	21	19	15
South Africa	1993	21	19	17	20	23
Tanzania	1993	13	16	16	16	38
Vietnam	1993	12	16	17	19	35

Source: World Bank (2001b: 80).

Note:

a. Includes only primary and secondary education.

grade 8, but only 20 per cent of children from the poorest 40 per cent of households do so (Filmer and Pritchett, 1999).

The high inequality of public education spending in poor countries stands in contrast to the predictions of the influential median voter theorem, which suggests that the poorer the country, the poorer will be the position of the median voter; therefore public spending should be more redistributive at lower per capita income levels. However, high inequality in spending is consistent with interest group models of the political process (Bernheim and Whinston, 1986; Dixit, Grossman and Helpman, 1997). In these models, individuals mobilize to form interest groups through which they can bargain with politicians over policies and resources. An interest group's formation as well as its bargaining power depends on the group's resources that can be used for lobbying,

contributions to political parties and direct bribes. Consequently, the more unequal a society's income distribution, the lower will be the bargaining power of the poor compared with the rich, and thus the greater will be the extent of expenditure allocations in favour of the rich.

Pineda and Rodriguez (2000) formally sketch models of both median voter and interest group models in the context of human capital formation. They find that, empirically, investment in human capital is inversely related to the capital share in total output (which proxies for capital owners, who are assumed to be the wealthiest in society) and conclude that a model of interest group behaviour, rather than a median voter model, accounts for this negative relationship. More generally, other studies find evidence that the rich disproportionately influence the political process, with public subsidies tending to favour the wealthy (Alesina, 1998; World Bank, 2000).

3 The empirical framework

Any empirical investigation of the determinants of the distribution of education spending immediately faces the problem of a scarcity of consistent cross-country data. Ideally, a dependent variable based on education subsidies received by the different income quintiles (or something similar) should be used. But such data are available for only a few countries at best. Consequently, we use public spending per student on primary to tertiary education, expressed as a percentage of per capita GNP, as our measure. This is an imperfect, but available, measure. To reduce the influence of short-run fluctuations, we take an average of this ratio over the period 1993–1997. Our focus is therefore on the underlying structural factors that determine patterns of spending, rather than on shorter-term, macroeconomic factors.

Turning to the explanatory variables, a measure of income inequality (the Gini coefficient) captures the inequality in influence over the state that may exist between rich and poor. Moreover, to scrutinize the robustness of our hypothesis of interest group politics further, we also investigate how public spending on education is affected by the income shares of the lowest 20 per cent and lowest 40 per cent relative to the income share of the top 20 per cent. Because of the potential simultaneity problem between unequal public spending and income inequality and the different quintiles' share of income, we regress the ratio of public spending on primary education to spending on tertiary education (averaged over 1993–1997) on the average value of the Gini coefficient over the period 1980–1989. Similarly, regarding quintile shares, we use the average value over 1980–1989. Thus these inequality measures are predetermined with

respect to public spending on education in our empirical model and can therefore be viewed as proxies for initial inequality.

A second key explanatory variable is ethnic diversity (as measured by ethnolinguistic fragmentation). The literature on the impact of ethnic diversity on economic performance has grown substantially in recent years. The first generation of studies tends to find negative development effects from higher levels of ethnic diversity. Thus Easterly and Levine (1997) conclude that ethnic diversity encourages the adoption of growth-retarding policies that foster rent-seeking behaviour; these in turn make it more difficult to form a consensus for public spending on public goods that promote growth. The impact of ethnic diversity on the structure of spending has also been found to be adverse. In Alesina and Spolaore (1997), a public good such as a school brings less satisfaction to everyone in an ethnically diverse society because of different preferences for the language of instruction, curriculum, location, and so on. So less of the public good is chosen by the society, thereby lowering the level of output and growth. Using a sample of US cities, Alesina, Baqir and Easterly (1997) find that the level and variety of public goods worsen as ethnic diversity increases. Miguel (1999) likewise finds lower primary school funding in more ethnically diverse districts in Kenya. More recent (second-generation) research, however, finds that the relationship between ethnic diversity and development outcomes is more nuanced, at least for growth, and strongly depends on the characteristics of the country's political system. Thus Collier (2001: 143) concludes that "ethnic diversity has no adverse effects on growth in fully democratic societies, but reduces growth by up to three percentage points in dictatorships". In highly diverse societies, in which no one ethnic group is dominant, it may be more difficult for lobbies to form than in less diverse societies, where interest groups with regard to the allocation of public spending may form around dominant ethnic groups.

We therefore use ethnolinguistic fragmentation as a regressor in order to investigate whether, in more ethnically diverse societies, concentration of political and economic power into the hands of one or a few ethnic groups results in a more unequal structure of public spending on education. Ethnolinguistic fractionalization (ELF) measures the probability that two randomly selected people from a given country will not belong to the same ethnolinguistic group,¹ and this variable has been widely used in the literature to proxy for ethnic fragmentation (for instance, Easterly and Levine, 1997, and Mauro, 1995, among others). In order to capture a much broader dimension of ethnic diversity, we use a measure of ethnic fragmentation that comprises (i) an average of the probability that two randomly selected people from a given country (a) will not belong to the same ethnolinguistic group, (b) will not speak the same

language (Muller, 1964; Roberts, 1962); (ii) the percentage of the population not speaking the official language (Gunnemark, 1991); and (iii) the percentage of the population not speaking the most widely used language (Gunnemark, 1991). This index (termed AVELF) is also used in Easterly and Levine (1997) and is taken from there. As a robustness check, we run the regressions using this broad index of ethnic diversity as well as using ethnic fragmentation. The results are very similar and thus we report only the regression results that use AVELF as a regressor.

We also include an Africa dummy variable, because Africa has high levels of ethnic fragmentation. In addition, however, many African countries have gone through a transition to multi-party politics over the past decade. By 1999, 45 countries had multi-party constitutions, compared with only 8 in 1988 (Thomson, 2000: 216). The inclusion of the Africa dummy may therefore partly control for the effect of democratization in dampening the effects of ethnic diversity in some African countries (i.e. the thesis advanced by Collier, 2001).

Our third key issue for investigation is the impact of violent conflict on the structure of public spending in education. The role of conflict in determining expenditure outcomes has been neglected, despite its prevalence in developing countries (Addison and Murshed, 2001). There are several channels through which conflict can influence public education spending. Conflict reduces the tax base, thereby reducing the revenues for expenditures, and military expenditures rise at the expense of the social sectors (see table 3.3). With the contraction in total resources and the rise in private discount rates (owing to increased uncertainty), interest groups will intensify their lobbying for shares in this reduced pie and the poor are likely to lose out. In Angola, for example, basic social spending has collapsed over the past decade (Adata de Sousa et al., 2003). Conflict also has direct effects on education owing to the destruction of physical capital, infrastructure (including school buildings) and human capital. This destruction is often greatest in rural areas, which is where most of the poor live in low-income countries (Mozambique is an example), and thus primary education expenditures are likely to contract proportionately more than spending on secondary and tertiary education, which is tilted towards urban areas.

The fall in the share of primary education may not necessarily be reversed post war, because the rich may successfully lobby (or hold state power, as in Liberia) to skew reconstruction spending towards themselves. Moreover, war can significantly raise income inequality – often the poor are hit disproportionately hard, whereas the rich and the “new rich” may reap wartime rents from preferential access to rationing, etc., thereby increasing their resources available for political lobbying to the detriment of pro-poor spending. Post-war growth may therefore be

Table 3.3 Public expenditure on health, education and the military as a percentage of GNP in sub-Saharan Africa

	Public expenditure (percentage of GNP) on		Military expenditure (percentage of GNP), 1997
	Health, 1990–1998	Education, 1997	
Angola	3.9	–	20.5
Benin	1.6	3.2	1.5
Botswana	2.7	8.6	5.1
Burkina Faso	1.2	1.5	2.8
Burundi	0.6	4.0	6.1
Cameroon	1.0	–	3.0
Central African Republic	1.9	–	3.9
Chad	2.4	1.7	2.7
Congo, Democratic Rep.	1.2	–	5.0
Congo, Rep.	1.8	6.1	4.1
Côte d'Ivoire	1.4	5.0	1.1
Eritrea	2.9	1.8	7.8
Ethiopia	1.7	4.0	1.9
Ghana	1.8	4.2	0.7
Guinea	1.2	1.9	1.5
Kenya	2.2	6.5	2.1
Lesotho	3.7	8.4	2.5
Madagascar	1.1	1.9	1.5
Malawi	2.8	5.4	1.0
Mali	2.0	2.2	1.7
Mauritania	1.8	5.1	2.3
Mozambique	2.1	–	2.8
Namibia	3.8	9.1	2.7
Niger	1.3	2.3	1.1
Nigeria	0.2	0.7	1.4
Rwanda	2.1	–	4.4
Senegal	2.6	3.7	1.6
Sierra Leone	1.7	–	5.9
South Africa	3.2	7.9	1.8
Tanzania	1.3	–	1.3
Togo	1.1	4.5	2.0
Uganda	1.8	2.6	4.2
Zambia	2.3	2.2	1.1
Zimbabwe	3.1	–	3.8

Source: DFID (2001: 24–25).

Note: A larger proportion of military spending is “off budget” compared with education and health spending in many countries. Accordingly, the reported data on military spending should be treated as lower bounds.

narrower in the distribution of its benefits than pre-war growth (Addison and Murshed, 2001).

We try to proxy for the impact of conflict by using three different measures: the proportion of minorities belonging to minorities at risk in 1990, PROP90 (from Gurr, 1993); an index of racial tensions in 1984, RACIALT (from Knack and Keefer, 1995);² and an index of the intensity of conflict over the period 1989–1997 (from the Uppsala Conflict Data Project).³

Finally, countries rich in natural resources are often characterized by extreme inequality in the distribution of their resource rents. These are frequently captured by rich élites, particularly in mineral-exporting countries (Botswana is one of the few exceptions). This phenomenon usually goes together with a severe urban bias in public spending, which in itself tends to be detrimental to expenditure on rural primary education. Countries that are rich in natural resources (particularly mineral resources) also have a high propensity towards conflict, particularly in sub-Saharan Africa (Murshed and Perälä, 2000). We therefore include a dummy variable for whether a country is a major exporter of non-fuel primary commodities.⁴

The generic form of our empirical model can thus be represented as follows:

$$\begin{aligned} &\text{Inequality of public education spending} \\ &= f(\mathbf{X}, \text{income inequality, ethnic fragmentation,} \\ &\quad \text{conflict, Africa dummy, natural resource dummy}) \end{aligned} \quad (3.1)$$

where \mathbf{X} is a vector of standard controls, such as the initial level of per capita GDP (in our model, the year is 1990), RGDPPC90, and population density in 1997 (POPDEN).⁵ Several variants of this model are estimated across a sample of 41 countries,⁶ and the results are discussed in the next section.

4 Empirical findings

The key empirical findings of our political economy model of public spending on education are summarized in table 3.4. The adverse effect of initial income inequality on the share of primary education in education spending – which supports our interest group hypothesis – and the adverse effect of ethnic fragmentation as discussed above are prominent in model 1. Both of these effects are highly statistically significant. Quantitatively, holding other things constant, one standard deviation increase in the Gini coefficient decreases the ratio of primary spending to tertiary spending by

0.20 points. Similarly, one standard deviation increase in ethnic diversity increases the inequality of public spending by 0.18 points. Although both of the standard controls (real per capita GDP in 1990 and population density in 1997) are nearly significant at the 10 per cent level, their respective coefficients imply that they have no substantial impact on public expenditure.

In models 2 and 3, we introduce two separate measures to proxy for conflict, PROP90 and RACIALT. Neither has a (statistically) significant effect on the distribution of public spending and, moreover, inclusion of each of these conflict measures reduces both the economic and statistical significance of AVELF. But the coefficient on income inequality remains highly significant.

Each of these conflict measures has an ethnic dimension, and in our sample we find a reasonable degree of correlation between each of these variables and AVELF. The partial correlation coefficient between AVELF and PROP90 is .47, implying that, as the degree of ethnic fragmentation rises, so too does the proportion of the population belonging to minorities at risk. Interestingly, the rather high and negative (−.73) partial correlation coefficient between AVELF and RACIALT may imply that, the higher the ethnic diversity, the lower will be racial tension – perhaps because higher ethnic diversity raises the willingness to cohabit among different ethnic/racial groups (in the manner suggested by Collier, 2001).

Because of this correlation between conflict measures and ethnic diversity, and particularly given our small sample size, we further try to investigate the impact of conflict in the absence of controlling for AVELF, in order to assess the sensitivity of the effect of conflicts and ethnic diversity. Now, in model 4, we find a highly significant adverse impact of conflict, proxied by PROP90, on the distribution of public spending. Quantitatively, one standard deviation increase in PROP90 increases the inequality of public spending in education by 0.20 points. However, RACIALT is still insignificant in model 5.

Since each of these conflict measures has an ethnic dimension, we further investigate the combined effect of ethnic diversity and conflict on public spending on education by interacting AVELF and PROP90 (AVELPRO in model 6) and AVELF and RACIALT (AVELRAC in model 7). Each of these combined measures of ethnic diversity and conflict now seems to have a significant impact on inequality in education expenditure. Quantitatively, in model 6, one standard deviation increase in AVELPRO increases the inequality in public spending by 0.20 points, and in model 7 one standard deviation increase in AVELRAC increases the inequality in education spending by 0.22 points.⁷

The empirical findings provide strong support for an interest group

Table 3.4 Regression results: Dependent variable – public spending per student (as percentage of GNP) in primary education/public spending per student (as percentage of GNP) in tertiary education

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
<i>RGDPPC90</i>	0.00 (1.65)	0.00 (1.67)	0.00 (1.60)	0.00 (2.00)	0.00 (1.76)	0.00 (2.00)	0.00 (1.61)	0.00 (1.43)	0.00 (1.47)	0.00 (1.72)	0.00 (1.81)	0.00 (1.54)	0.00 (1.56)
<i>POPDEN</i>	-0.00 (1.64)	-0.00 (1.97)	-0.00 (-1.39)	-0.00 (-2.98)	-0.00 (-1.57)	-0.00 (-2.71)	-0.00 (5.27)	-0.00 (-1.41)	-0.00 (-1.42)	-0.00 (-3.06)	-0.00 (-2.94)	-0.00 (-1.20)	-0.00 (-1.22)
<i>AVELF</i>	-0.61 (-2.08)	-0.33 (-1.03)	-0.42 (-1.33)	-0.02 (-0.02)	-0.02 (-0.02)	-0.02 (-0.02)	-0.01 (-0.01)	-0.75 (-2.16)	-0.70 (-2.04)				
<i>GINI80s</i>	-0.02 (-3.91)	-0.02 (-3.69)	-0.02 (-3.03)	-0.02 (-3.60)	-0.02 (-3.20)	-0.02 (-3.68)	-0.01 (-3.05)						
<i>PROP90</i>		-0.52 (-1.53)		-0.74 (-2.97)						-0.65 (-1.53)	-0.62 (-1.52)		
<i>RACIALT</i>			0.03 (0.52)		0.08 (1.40)							0.11 (1.74)	0.10 (1.64)
<i>AVELF*</i>						-1.07 (-3.79)							
<i>PROP90</i> (<i>AVELPRO</i>)													
<i>AVELF*</i>							-0.29 (-2.22)						
<i>RACIALT</i> (<i>AVELRAC</i>)													
<i>TOPBOT20</i>													
<i>TOPBOT40</i>													
								1.68 (2.05)		2.56 (2.83)	1.14 (2.98)	1.67 (1.92)	0.78 (2.22)
No. of observations	41	26	38	26	38	26	38	36	36	23	23	33	33
Adj. R^2	.26	.52	.19	.51	.20	.50	.25	.21	.21	.45	.47	.17	.18

Sources: Income inequality measures are from the WIDER World Income Inequality Database (WIID) (all OKIN categories); RGDPPC90 and public expenditure per student at primary, secondary and tertiary levels are from the World Bank World Development Indicators database; AVELF, PROP90 and RACIALT are from Easterly and Levine (1997).

Notes: Constant term is not reported. White's heteroscedasticity-consistent t -ratios are in parentheses.

theory of politics, with the unequal lobbying power of the rich and the poor resulting in a distribution of public spending on education that is tilted towards the former. We also find some support for the potentially adverse impact of ethnolinguistic fragmentation, conflict and the interaction of ethnic fragmentation and conflict on the inequality of public spending on education.

To examine the robustness of our interest group hypothesis in further detail, we run a similar set of regressions, this time replacing the Gini coefficient by (i) the ratio of the income share of the lowest 20 per cent to the highest 20 per cent and (ii) the ratio of the income share of the lowest 40 per cent to the highest 20 per cent (table 3.4). According to our hypothesis, the higher the initial income share of the poorest group(s) relative to the richest group, the greater will be their bargaining power over public spending. Public spending on primary education relative to tertiary spending will therefore increase (decrease) with the increase (decrease) of the income share of the bottom quintile or bottom 40 per cent relative to the top 20 per cent (models 8–13 in table 3.4). As can be seen from table 3.4, our prediction seems to be strongly supported by the empirical results.

Introducing an Africa dummy (Dummy for SSA) reduces the strength of the ethnolinguistic fragmentation variables but does not change their (negative) sign (table 3.5). Because Africa is one of the most ethnically fragmented regions, this may reflect the fact that the Africa dummy is capturing fragmentation per se, or that the democratic transition in some African countries over the past decade has diluted (but not reversed) the otherwise negative impact of ethnolinguistic fragmentation (thus supporting Collier, 2001).

Introducing a dummy for the share of non-fuel primary commodity exports (PRIMNFX) also has an adverse effect on inequality in public spending on education (table 3.6). This may indicate that the rents from mineral exports are narrowly allocated towards the élite in many countries (Zambia, for example, failed to use its copper wealth to invest adequately in basic social services).

Figures 3.1 to 3.4 graph the relationship between our measure of inequality in public spending on education and measures of income inequality and ethnic diversity.

5 Conclusions and policy implications

Access to good-quality primary education is an important means for raising the participation of the poor in economic growth, aside from its

Table 3.5 Regression results with Africa dummy: Dependent variable as in table 3.4

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
<i>RGDPPC90</i>	0.00 (1.66)	0.00 (1.88)	0.00 (1.69)	0.00 (1.44)	0.00 (1.45)	0.00 (1.48)	0.00 (1.59)	0.00 (1.63)	0.00 (1.50)	0.00 (1.52)
<i>POPDEN</i>	-0.00 (-2.18)	-0.00 (-3.38)	-0.00 (-1.83)	-0.00 (-3.42)	-0.00 (-1.83)	-0.00 (-1.86)	-0.00 (-2.92)	-0.00 (-2.84)	-0.00 (-1.32)	-0.00 (-1.33)
<i>AVELF</i>	-0.39 (-1.20)				-0.54 (-1.45)	-0.50 (-1.34)				
<i>GINI80s</i>	-0.02 (-3.76)	-0.02 (-3.92)	-0.02 (-3.31)	-0.02 (-3.52)						
<i>PROP90</i>		-0.44 (-1.78)					-0.76 (-2.09)	-0.73 (-2.12)		
<i>RACIALT</i>			0.07 (1.17)						0.10 (1.59)	0.10 (1.50)
Dummy for SSA	-0.27 (-2.71)	-0.41 (-4.69)	-0.41 (-5.86)	-0.45 (-4.68)	-0.31 (-2.74)	-0.32 (-2.80)	-0.44 (-3.86)	-0.45 (-5.57)	-0.36 (-5.37)	-0.34 (-5.35)
<i>TOPBOT20</i>					1.51 (1.89)		2.30 (2.50)		1.64 (1.87)	
<i>TOPBOT40</i>						0.72 (2.25)		1.05 (2.78)		0.77 (2.15)
No. of observations	41	26	38	44	36	36	23	23	33	33
Adj. R^2	.26	.69	.32	.29	.32	.33	.66	.68	.15	.16

Source: See table 3.4.

Notes: Constant term is not reported. White's heteroscedasticity-consistent t -ratios are in parentheses.

Table 3.6 Regression results with dummy for non-fuel primary commodities exporters: Dependent variable as in table 3.4

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
<i>RGDPPC90</i>	0.00 (1.62)	0.00 (1.64)	0.00 (1.88)	0.00 (1.72)	0.00 (1.41)	0.00 (1.44)	0.00 (1.55)	0.00 (1.60)	-0.00 (1.51)	0.00 (1.53)
<i>POPDEN</i>	-0.00 (-1.81)	-0.00 (-2.19)	-0.00 (-3.07)	-0.00 (-1.68)	-0.00 (-1.54)	-0.00 (-1.55)	-0.00 (-2.85)	-0.00 (-2.77)	-0.00 (-1.36)	-0.00 (-1.36)
<i>AVELF</i>	-0.54 (-1.91)	-0.38 (-1.17)			-0.69 (-2.00)	-0.65 (-1.88)				
<i>GINI80s</i>	-0.02 (-3.04)	-0.02 (-3.26)	-0.02 (-2.96)	-0.01 (-2.02)						
<i>PROPP90</i>			-0.64 (-2.63)				-0.84 (-2.19)	-0.81 (-2.20)		
<i>RACIALT</i>				0.07 (1.33)					0.10 (1.61)	0.10 (1.54)
Dummy for SSA		-0.23 (-2.48)								
<i>TOPBOT20</i>					1.44 (1.60)		2.16 (2.27)		1.37 (1.45)	
<i>TOPBOT40</i>						0.69 (1.88)		0.98 (2.48)		0.65 (1.67)
<i>PRIMNFX</i>	-0.17 (-1.71)	-0.11 (-1.32)	-0.24 (-2.19)	-0.23 (-2.02)	-0.19 (-1.63)	-0.18 (-1.56)	-0.29 (-2.22)	-0.30 (-2.30)	-0.23 (-2.09)	-0.21 (-1.85)
No. of observations	41	41	26	38	36	36	23	23	33	33
Adj. R^2	.25	.24	.56	.20	.19	.20	.52	.54	.16	.17

Source: Data on primary commodity exporters are taken from the World Bank's Global Development Network Database.

Notes: Constant term is not reported. White's heteroscedasticity-consistent t -ratios are in parentheses.

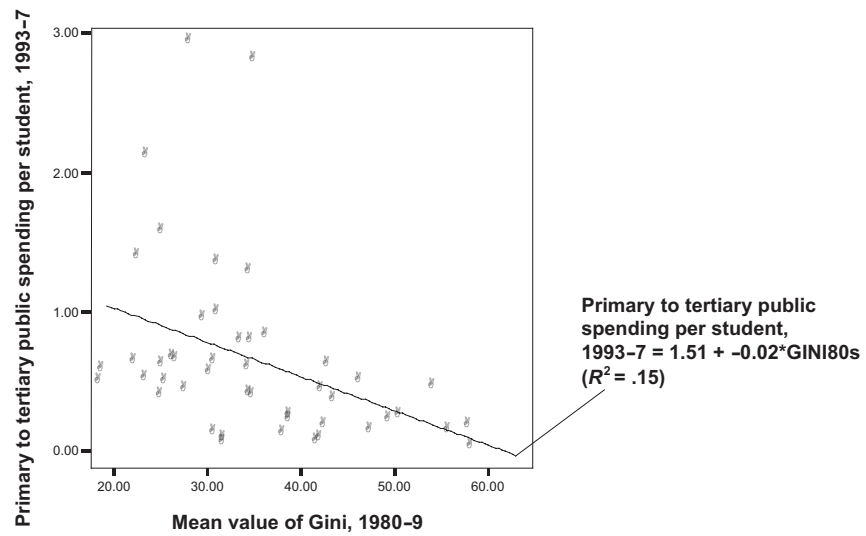


Figure 3.1 Primary to tertiary spending ratio and income inequality

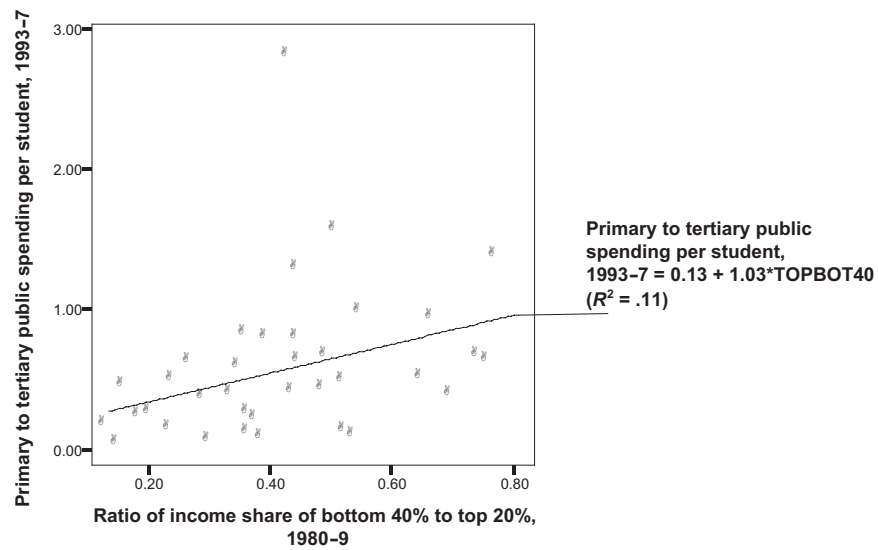


Figure 3.2 Primary to tertiary spending ratio and income share of bottom 40 per cent to top 20 per cent

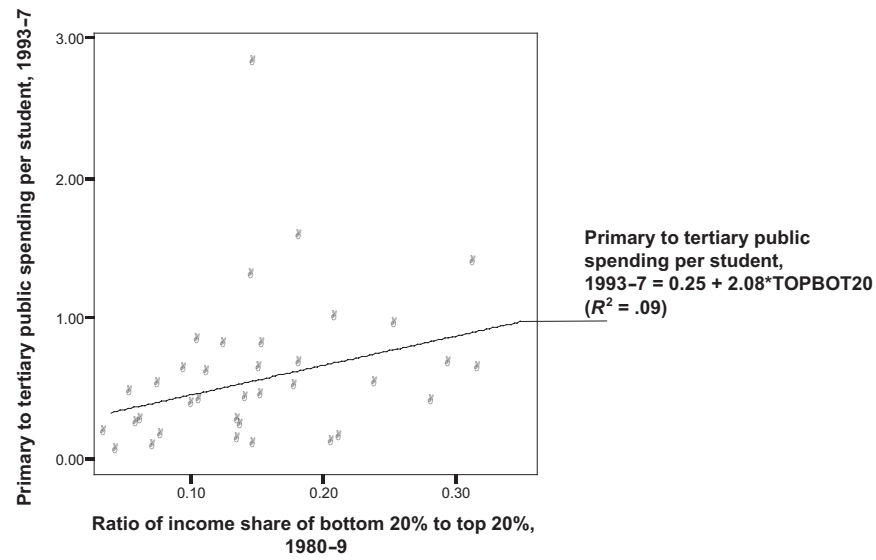


Figure 3.3 Primary to tertiary spending ratio and income share of bottom 20 per cent to top 20 per cent

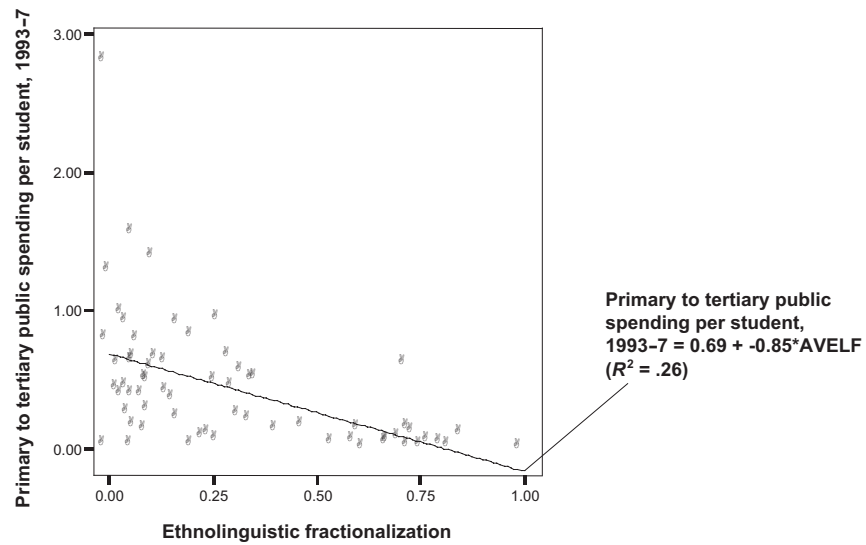


Figure 3.4 Primary to tertiary spending ratio and ethnolinguistic fractionalization

direct human development benefits. This chapter has investigated why the distribution of public spending in education is often skewed away from primary education – the level of education of most benefit to the poor – despite the high private and social returns to investing in good-quality primary schooling. We find that a high level of initial income inequality is a determinant of such skewed public spending, thereby perpetuating, and even increasing, income inequality as well as poverty over time. This confirms the plausibility of the interest group model as an explanation of spending outcomes. We also find that conflict is significant in skewing public spending away from primary education. Ethnic diversity (as measured by ethnolinguistic fragmentation) tends to reduce the relative share of primary spending (thus supporting the conclusions of the first-generation studies on this topic). But this issue needs further investigation by introducing democratization variables to capture the effect of democratization in reducing and reversing the negative effects of ethnic diversity (as argued by Collier, 2001).

Our results raise some difficult policy issues. First, efforts to shift public spending towards primary education are likely to meet considerable political resistance from the affluent, and such resistance is likely to be most evident, as well as most effective, in societies with already high income inequality. The experiences of Brazil, Guatemala and South Africa seem to bear this out. The achievement of a more pro-poor spending distribution cannot therefore be seen in isolation from redistributive measures in other areas (for example, land reform and redistributive taxation). Through altering income distribution, and thus the balance of political power, such measures will strengthen the hand of the poor in the political competition for public spending.

Second, in highlighting inequality in education spending, we do not imply that the solution to low primary school spending is necessarily to transfer resources from secondary and tertiary education into the primary level (see UNICEF, 1999, and Watkins, 2001, on policy issues). Finding resources for basic services such as primary education is too often seen as a task of reallocating resources within the education sector, rather than across all categories of public spending. There may well be large “unproductive” lines of spending (outside of education) that could be redistributed to better uses. Indeed, halving military spending could double or triple total public spending on education (and health) in many countries (see table 3.3). In addition, most countries could mobilize more revenues through closing tax exemptions (which generally favour the better off) and creating better tax institutions. These avenues should be fully explored alongside any reallocation of resources within the education sector itself.

Notes

Useful comments were received from participants at the WIDER Conference on Growth and Poverty (Helsinki, 25–26 May 2001) as well as from Oliver Morrissey and an anonymous reviewer of this chapter. Any errors remain our own.

1. *Atlas Narodov Mira 1964*.
2. The value of the index ranges between 1 (low tension) and 6 (high tension).
3. “Uppsala Conflict Data Project: States in Armed Conflict”, Uppsala University, Sweden (Wallensteen and Sollenberg, 2000). The scale of intensity is as follows: 0 = no conflict; 1 = minor armed conflict; 2 = intermediate armed conflict; 3 = war.
4. This takes a value of 1 for a major exporter of non-fuel commodities, and 0 otherwise. The data on primary commodity exporters are from the World Bank’s Global Development Network Database (<http://www.worldbank.org/research/growth/>).
5. We also try as controls the share of different age groups, such as the share of the population aged 0–14 and the share of the population aged 15–64. These variables turn out to be insignificant in explaining the inequality in public spending on education, and they worsen the overall fit of the model. We therefore exclude these controls from our final estimations.
6. Australia, Austria, Belgium, Bulgaria, Chile, China, Colombia, Côte d’Ivoire, Denmark, Ethiopia, Finland, France, Greece, Guatemala, Honduras, Hungary, India, Ireland, Israel, Italy, Japan, Republic of Korea, Lesotho, Malaysia, Mauritania, Mauritius, Mexico, Morocco, New Zealand, Norway, Philippines, Poland, Portugal, Romania, Singapore, Spain, Sweden, Thailand, Tunisia, Turkey, United States.
7. We undertook a similar exercise using the intensity of conflict (as mentioned above). Although the results are similar, using intensity of conflict drastically reduces our sample size to 13–14. We thus exclude this indicator as a proxy for conflict.

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The fragility of empirical links between inequality, trade liberalization, growth and poverty

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1 Introduction

The initial objective in writing this chapter was to assess the evidence for a relationship between inequality, trade liberalization and poverty. This proved to be a frustrating, but we argue not entirely futile, enterprise largely because consistent comparative cross-country data on poverty are scarce. We use data from the World Bank's Global Poverty Monitor, the only source of consistent poverty headcount data comparable across countries, but this provides more than one observation only since the mid-1980s for about 30 countries. Lack of data on other variables of interest further restricted the sample. We report the results in the penultimate section. The results are weak; we find no robust evidence that inequality, or indeed growth, are determinants of cross-country variations in poverty. Poverty tends to be higher in sub-Saharan Africa (SSA), and lower in countries with higher initial income levels (unsurprising) and in countries that had a more open trade regime. We contend that this is not an irrelevant finding; any claims that are made regarding growth and poverty or trade liberalization (even globalization) and poverty should be interpreted with extreme caution. In this sense we reiterate the argument of Ravallion (2001) that heterogeneity of countries and the complexity of potential links between inequality, trade, growth and poverty render generalizations often misleading.

Because any analysis we can undertake relating directly to poverty

measures is limited, most of the chapter relates to indirect approaches. Specifically, we devote most attention to exploring evidence for developing countries on the effect of inequality and trade policy on growth, because economic growth is posited as being the most consistent indicator of potential gains in the incomes of the poor (Dollar and Kraay, 2002). This does not tell us about links between these variables and poverty, but it does allow us to identify factors that may indirectly affect poverty via their influence on growth.

Some researchers have circumvented the lack of direct measures by deriving measures of poverty indirectly from data on inequality (Dollar and Kraay, 2002). If those in the lower tail of the income distribution benefit proportionally from growth, then presumably the poor benefit. One difficulty with this approach is that there is no demonstrated systematic relationship between inequality and poverty; that is, changes in inequality do not explain changes in poverty, even if they tend to be positively correlated. Quah (2001) demonstrates that the increase in inequality required to increase poverty would have to be very large, greater than empirically observed for any sustained period in any country except transition economies in the 1990s. Nevertheless, if income inequality captures the fact that (large) sections of society are significantly disadvantaged, one would expect a direct positive correlation between inequality and poverty. This correlation may be weaker across richer countries, where the relatively poor are not absolutely poor (in international terms), but, if national income is low, the relatively poor are likely to be absolutely poor (we focus on developing countries only).

Although growth is proposed as a determinant of poverty reduction, there is no systematic relationship between economic growth and inequality (for example, Ravallion, 1997), and very little of the small changes in inequality observed can be explained by growth (Quah, 2001). Milanovic (2002) shows that, although global inequality rose between 1988 and 1993, this was owing almost completely to an increase in inequality *between* countries; within-country inequality was largely unchanged. In other words, “inequality is determined by factors which differ substantially across countries but tend to be relatively stable within countries” (Li, Squire and Zou, 1998: 27). In this context, inequality may capture country-specific effects that help to explain differences in growth between countries, which in turn may help to explain differences in poverty. Over time, inequality within countries, on average, tends to change very little and researchers have not identified any consistent determinants of changes in inequality (there are few empirical regularities in the data, as shown below). To observe that inequality *on average* appears not to change in a consistent manner misses the fact that inequality does change, and such changes can affect poverty (Ravallion, 2001). Although

growth with stable inequality may benefit the poor, growth with redistribution, or indeed redistribution without growth, will be pro-poor (Dagdeviren, van der Hoeven and Weeks, 2004; White and Anderson, 2001). For these reasons we consider the inequality–growth relationship and then factors relating to poverty and inequality separately.

If distribution is such that many are denied access to resources for investment and are discouraged from being entrepreneurial, inequality is directly associated with disincentives that reduce growth. In an economy in which power is concentrated, distortions are widespread and rent-seeking is prevalent, we may expect to observe relatively high levels of inequality and relatively poor growth performance. In this sense, inequality is associated with policy distortions that reduce growth and probably increase poverty (because the rich look after themselves); inequality per se may not directly affect growth. Policy reforms could reduce these distortions without directly affecting either inequality or poverty. For example, trade liberalization (the reduction or removal of trade-related distortions) should promote growth because it increases the efficiency of the economy, but the effect on inequality is ambiguous, at least in the short to medium term. Workers may shift from declining (import-competing) to expanding (exporting) sectors, without any change in the overall level of income inequality or poverty. In such a case, trade liberalization is a *signal* of policy reform that reduces (some) distortions, and would be expected to be associated with increased growth rates and, ultimately, lower poverty.

We begin by considering factors relating inequality and economic performance. Section 2 provides a brief overview of the theoretical and empirical literature on the impact of inequality on growth, and identifies some implications for effects on poverty. This review is intended only to establish the context; we do not attempt to test, or discriminate between, alternative theories (nor, it should be stressed, is our empirical analysis intended to identify the determinants of growth). Section 3 presents econometric results for the relationship between inequality, trade liberalization and growth. We use the data that have recently been made available in the World Income Inequality Database (WIID, compiled by the United Nations Development Programme and WIDER) to construct a panel of developing countries, including countries from SSA, for the empirical analysis. The principal finding is that inequality, and the types of policy distortions associated with inequality, are associated with lower rates of economic growth, but the result is not very robust. Section 4 presents our assessment of factors that may influence inequality and poverty. Neither growth nor inequality appears to be important in explaining cross-country differences in poverty in our sample; levels of poverty and inequality appear to be the result of country-specific features

not captured in our analysis. Section 5 presents a summary and conclusion, linking our results to the existing literature on inequality and growth.

2 A brief overview of the literature on inequality and growth

2.1 Theoretical approaches to inequality and growth

Most of the theoretical economics literature posits that inequality has a negative impact on growth. There are four general categories of theory that explain how an unequal initial distribution of assets and income can affect growth. For convenience these can be termed political economy, social conflict, credit market and X-inefficiency models.

Political economy model

The standard political economy explanations of the effect of inequality on growth are premised on median voter models (Bertola, 1993; Partridge, 1997; Persson and Tabellini, 1994). The logic is that political decisions to redistribute income are more likely to be made when inequality is greater, and will result in economic policies that tax investment and therefore reduce growth (Alesina and Rodrik, 1994; Persson and Tabellini, 1994). These models assume both implicit, if not actual, democracy and that redistribution is implemented in a way that reduces growth. The redistribution could have an immediate effect of reducing poverty, but the slower growth suggests this would not be sustained. Although these models may have some validity for relatively advanced economies, they hardly seem an appropriate way to represent the majority of developing countries over the past three decades. The underlying mechanism is that, in order to maintain support, the political élite redistributes income and in doing so reduces the return on capital. There is little evidence for this in developing countries. The successful East Asian economies implemented redistribution via land reform, public spending or real wages, rather than by discouraging investment (Morrissey and Nelson, 1998). Few African or Latin American countries have redistributed income; the productivity of capital may be low, but this is not because of redistribution.

Social conflict model

The social conflict models can also be viewed as political economy in nature, and perhaps more applicable to the majority of developing countries. The underlying premise is that an unequal distribution of resources is a source of political tension and social conflict. One might expect that

poverty would be relatively high in unstable environments, or at least would not be falling significantly; poverty and inequality will be positively correlated. In such a socio-political environment, property rights are insecure and this discourages accumulation. The higher is the gap between the rich and the poor, the greater is the temptation to engage in rent-seeking, and this in turn reduces investment (Benabou, 1996). Alesina and Perotti (1996) argue that greater inequality leads to less political stability and consequently suboptimal investment levels.¹ This channel finds support from Rodrik (1998), who argues that greater inequality increases the share of resources dedicated to bargaining over distribution of rent, thereby slowing the political system's effective response to external shocks.

Banerjee and Duflo (2001) propose a model that combines political economy and social conflict insights. Groups in a society bargain over whether "growth-promoting" policies will be implemented. In order to "buy off" the poorer group, the rich have to offer some redistribution. If insufficient redistribution is offered, the poorer group withholds support and the beneficial policies are not implemented. Although consistent with some of the stylized facts, this approach has limited applicability to developing countries. First, in developing countries one rarely observes an attempt, even implicit, by an élite to offer transfers to the poor (hence poverty is not falling over time).² Second, the élite often resist change not because of bargaining but because it threatens their control over resources and rents. The problem in many developing countries is that no bargaining occurs. Thus, whereas Banerjee and Duflo (2001) are concerned to explain how (breakdowns in) bargaining give rise to changes in inequality (redistribution) that reduce growth, the fact of developing countries is that inequality is persistent.

Credit market model

The credit market channel proposed by Chatterjee (1991) and Tsiddon (1992) is underpinned by the fact that investments are lumpy and access to credit depends on the existence of collateral. Consequently, there is a credit constraint stemming from unequal initial distribution of assets, and this hinders growth. In this context, inequality of land holdings represents a constraint on growth in the agriculture sector, typically the major productive sector in poor developing countries. This is consistent with arguments that stress the importance of land reform in providing a platform for growth. A related argument is that greater income equality encourages human capital accumulation, because there are fewer liquidity constraints and investment in human capital is lumpy (Chiu, 1998). The poor would tend to face the most severe credit constraints and these models offer one explanation for why it is so difficult for the poor to lift

themselves out of poverty. Targeted policy interventions are required to reduce poverty. Thus, this model also suggests a correlation between poverty and inequality.

X-inefficiency models

A fourth approach is based on the argument that high inequality reduces the X-efficiency of workers. X-efficiency refers to a measure of workers' productivity, holding constant all other inputs into the production process including workers' skills (Leibenstein, 1966; cited in Birdsall, Ross and Sabot, 1995). Workers' productivity is limited by a "virtual" glass ceiling because they do not visualize themselves progressing beyond a certain point, and this discourages effort and perpetuates a vicious cycle of low incomes and therefore high inequality. Thus, inequality has a disincentive effect that retards growth. This model relates to incentives and labour productivity (and is not obviously linked to poverty), rather than investment and accumulation (which underpin the other models). As such, this can be viewed as a direct effect of inequality on growth that should be apparent even over the relatively short run. The accumulation-based models, in contrast, are long run in nature and relate inequality to growth in an indirect way.

2.2 Empirical evidence on inequality and growth

The 1990s saw a growing interest in research on whether inequality retards growth. The results of a number of studies are summarized in table 4.1. Most empirical work has relied on the Gini coefficient or income share as a measure of inequality. Birdsall, Ross and Sabot (1995) find weak evidence for a negative effect of inequality on economic growth, but the finding is not significant when a Latin America dummy variable is included. They also find that income inequality is not significant when land inequality is included, inferring from this that unequal access to productive resources (land) is the fundamental feature of the economic structure captured by income inequality. In other words, it is not income inequality per se that retards growth. Alesina and Rodrik (1994) find an income inequality effect independent of land inequality, although land inequality has a greater (negative) influence on growth. Birdsall and Londono (1997) find that the significance of initial land inequality is not robust to the inclusion of a dummy for the Latin America and Caribbean region (Knowles, 2001, offers an explanation for this). Initial education inequality appears to have the greatest (negative) influence on growth among all the variables capturing initial inequality, lending support to the argument of Chiu (1998). Deininger and Squire (1998) find a negative

link between initial inequality and subsequent growth, although this result is robust only for land inequality. This negative relationship is supported by other studies. Of the six studies in table 4.1, four found a negative relationship between income inequality and growth in the long run, while for two the effect was insignificant or not robust. Benabou (1996: table 2) summarizes a range of studies and shows that the balance of evidence is for a negative and significant relationship.

The differences in the results from studies of the inequality–growth relationship can be largely attributed to four factors (all identified in table 4.1): data quality, time-period, sample coverage and estimation methods. Data quality is a general problem in growth regressions including developing countries but is especially acute for inequality data. The Deininger and Squire (1996) database is widely accepted as one of the most reliable sources of data on inequality and is used in the more recent studies (and is included in the WIID data source we draw on).³

With regard to the time-period, almost all studies before 1996 are based on long-period averages for a cross-section of countries, and thus capture any “long-run” relationship. Later studies use the Deininger and Squire (1996) data, which provide observations for a large number of countries over the period 1960–1992. Forbes (2000), for example, uses sub-period panels to examine the “short-run” relationship. She finds a positive, significant and robust relationship between inequality and growth in the medium and short run; that is, higher inequality is associated with higher growth. This is in contrast to the evidence for a negative relationship in the long run.

Another factor explaining the divergence in results is the sample coverage. Forbes (2000), for example, includes no SSA country and half of the sample comprises OECD countries (most others are relatively rich developing countries). About half of the countries in the samples used by Deininger and Squire (1998), Barro (1999) and Banerjee and Duflo (2001) are developing countries. The evidence suggests that the relationship is different for OECD compared with less-developed countries (LDCs).

Another reason for differences in results could be the estimation methods. Cross-section estimation methods have many weaknesses, documented by, among others, Levine and Renelt (1992). The use of panel estimation methods to control for country- and time-specific effects has been precluded by the paucity of good-quality data. Forbes (2000) stands out in this regard. Furthermore, the inability of cross-country work to address the effect of a change in a country’s inequality level on within-country growth provides justification for the use of panel data methods (Forbes, 2000).

Table 4.1 Overview of some studies on inequality and growth

Study	Period	Sample	Estimation	Results (on inequality)
Persson and Tabellini (1994)	1830–1885	Developed countries, some LDCs “Low” quality data	Pooled OLS	Negative effect of income share of richest 20 per cent
Alesina and Rodrik (1994)	1960–1985	70 countries “Low” quality data	OLS and 2SLS	Negative effect of income and land Gini
Birdsall, Ross and Sabot (1995)	1960–1985	74 countries “Low” quality data	Pooled OLS	Negative effect (ratio of income share of richest 20 per cent to bottom 40 per cent)
Deininger and Squire (1998)	1960–1992	27 developing countries ^a “High” quality data	Pooled OLS	Negative effect of land Gini but income Gini not significant
Forbes (2000)	1965–1995	30 (mostly developed) countries “High” quality data	Panel data (four methods)	Negative long-run effect but positive short-run effect of income Gini
Banerjee and Duflo (2001)	1965–1995	45 or 50 countries	Panel and non-linear	No robust effect of inequality on growth; <i>changes</i> in inequality reduce growth

Source: Summary of indicated studies compiled by the authors.

Notes: Most studies report results with various samples, often using different econometric techniques; the principal results are included here. OLS = ordinary least squares; 2SLS = two-stage least squares.

a. This study also includes results for samples with developed countries.

3 Results on inequality, openness and growth

What emerges from the foregoing discussion is that there is likely to be a negative relationship between inequality and growth in the long run, but not in the short run. In general, one would expect poverty to be higher in countries with higher levels of inequality. Research on the inequality–growth relationship has tended not to include SSA countries in the sample, nor has the potential role of trade and trade policy been explored. Because trade liberalization is an indicator of economic policy shifting to a market-oriented regime with greater incentives, it should have a positive impact on growth. Our empirical analysis extends the literature in these two directions – focusing on developing countries and including trade variables. We first consider cross-section estimates of the long-run relationship, then panel estimates to capture short-run effects.

As with all empirical growth regressions, there is a trade-off between maintaining adequate degrees of freedom (by being parsimonious in the number of explanatory variables included) and avoiding omitted variable bias (by including the most important variables). We address this by following the specifications most commonly used in the inequality–growth literature, and reporting results when additional explanatory variables are included. In practice, we are constrained by data availability (specifically on inequality and openness) and by the problem that some explanatory variables are collinear (and hence should not be included together). The latter problem can be to our advantage because some variables, such as initial GDP and inequality, can capture the influence of other potential explanatory variables, such as human capital and political regime.

3.1 Cross-section (long-run) results

For the basic “long-run” regression we use cross-section data for 44 developing countries over the period 1970–1995 (the list of countries and details on data sources are provided in the appendix). The growth literature points to the importance of initial values in explaining subsequent growth. We estimate a standard version of the cross-country growth regressions now prevalent in the literature. The base specification is a modification of Lensink and Morrissey (2000), including initial inequality (*GINI*, the value of the Gini index for the year closest to 1970) but excluding aid. The basic variables in the growth regressions are the investment/GDP ratio (*INV*, average over the period), initial income per capita in 1970 (*GDP0*) and initial human capital as proxied by the secondary school enrolment rate in 1970 (*HCO*).⁴ The basic equation estimated, where the dependent variable is per capita GDP growth over the period (*g*), is:

$$g = \beta_0 + \beta_1 GINI + \beta_2 GDP0 + \beta_3 HCO + \beta_4 INV + \mu. \quad (4.1)$$

GDP0 and *HCO* are included because they have been shown to have a robust and significant impact on economic growth (Lensink and Morrissey, 2000). If *GDP0* captures convergence, the expected sign is negative but, if it captures initial conditions, the sign may be positive. The coefficient on *GINI* is expected to be negative. The coefficients on *HCO* and *INV*, representing human and physical capital respectively, are expected to have positive signs.

This specification is similar to that used in most empirical work in this area (Perotti, 1996; Forbes, 2000), although precise measures of the variables differ from study to study. The variables included are widely accepted as core explanatory variables. The reasons for not including additional variables are similar to those advanced by Forbes (2000) and Perotti (1996), namely, the need to maximize degrees of freedom given the limited availability of inequality data and to facilitate comparability between studies. Nevertheless, we do include other variables relating to trade policy. We do not report the entire array of estimates that can be obtained, but do emphasize which findings are fragile and in what circumstances.⁵ The results should be interpreted cautiously, given the limited sample size and the exclusion of variables that others have found to be significant determinants of growth. However, the inclusion of initial GDP should capture some country-specific effects. We also include a dummy for Latin American countries (*LAdum*), because other studies have found this to be significant, and for sub-Saharan African countries (*SSA*), because there is a general tendency for an “SSA” dummy to be negative and significant in cross-country growth regressions (Collier and Gunning, 1999). We later include trade variables.

Table 4.2 presents the results from estimating the basic equation with income inequality in the first three columns. Investment is the principal “driver” of growth, an expected result although our human capital variable is not significant. Although growth may itself be a determinant of investment, implying potential endogeneity, our use of the average investment/GDP ratio implies that this should not be a serious problem for overall period growth rates. Endogeneity of inequality is not a problem because we are using the initial value of the Gini but period growth. Similarly, because the dependent variable is long-term growth, it is unlikely that endogeneity of other explanatory variables is a problem. The coefficient on *GINI* is found to be negative; that is, higher inequality results in lower growth. This result is robust to the inclusion of either regional dummy alone (we report only for *SSA*, which is significant – *LAdum* alone is not significant), but is not robust to the inclusion of both regional dummies together regression (3).

The pattern of results shows that the regional dummies are important. In respect of the income inequality sample, 23 per cent of the countries are SSA and have the highest mean Gini, and 41 per cent are LA and have the next-highest mean Gini; the other countries, 36 per cent of the sample, have the lowest mean Gini (see appendix table 4A.2). Thus, it is not surprising that the coefficient on *GINI* is insignificant when both regional dummies are included. Inequality in the distribution of land (for which the total sample is smaller) is highest for LA (44 per cent of the sample); SSA accounts for 15 per cent of the sample and has a mean *landGINI* above that of “others” (table 4A.2). Additional regressions not reported here show that the inclusion of both regional dummies eliminates the significance on *landGINI*, as might be expected.

The final two columns report results using data for inequality in the distribution of land (*landGINI*) based on the smaller sample. Contrary to Birdsall and Londono (1997), we find that the significance of initial land inequality is robust to the inclusion of either regional dummy alone (but

Table 4.2 Cross-section regressions for GDP per capita growth

	Equation				
	(1)	(2)	(3)	(4)	(5)
<i>GINI</i>	−0.06 (−2.72)***	−0.04 (−2.11)**	−0.02 (−1.08)		
<i>landGINI</i>				−0.04 (−1.71)*	−0.03 (−2.31)**
<i>GDP0</i>	−0.0004 (−1.62)	−0.0003 (−1.30)	−0.0003 (−1.52)	−0.0005 (−1.74)*	−0.0005 (−1.91)*
<i>HC0</i>	0.01 (0.51)	−0.01 (−0.60)		0.03 (1.50)	0.03 (1.60)
<i>INV</i>	0.32 (7.62)***	0.32 (7.63)***	0.28 (6.85)***	0.25 (5.46)***	0.25 (5.62)***
<i>SSA</i>		−1.27 (−1.80)*	−1.91 (−2.83)***		
<i>LAdum</i>			−1.23 (−2.23)**	0.22 (0.32)	
Adjusted R^2	.62	.64	.68	.65	.66
<i>N</i>	44	44	44	34	34

Source: Authors' estimates.

Notes: Figures in parentheses are *t*-ratios: *** significant at 1 per cent, ** significant at 5 per cent, * significant at 10 per cent. The *F*-test supports the hypothesis that all coefficients are jointly significant (i.e. rejects the null that all are zero). *HC0* is not significant even if initial GDP is omitted. Diagnostic tests reveal no evidence of serial correlation or heteroscedasticity. The normality assumption of the error term is not violated and tests support the functional form used.

not to including both), and that *LAdum* is not significant. However, the significance of land inequality is not robust to the exclusion of Argentina, Israel and Venezuela (all of which have very high land inequality and relatively high initial GDP). If these are omitted from the sample, the coefficient on *landGINI* is insignificant but that on *GDP0* is negative and significant (results available on request). This suggests that, excepting these countries, land inequality and initial GDP are negatively correlated and it is not possible to distinguish the two effects. This supports the claim that land inequality captures inherent growth-retarding distortions that are reflected in initial values. Overall, the results in table 4.2 reveal the difficulty inherent in cross-country growth regressions: growth experiences are heterogeneous and it is difficult to identify variables for all countries that are consistently significant. Investment is the only such variable in our case. Note that initial GDP is generally insignificant, and coefficients on inequality are generally robust, but both capture similar country effects for most of the sample. Because both measures of inequality are higher for SSA and LA, which together account for about two-thirds of each sample, the insignificance of inequality when both are included does not imply that inequality is unimportant. Rather, there appear to be unobserved features of these regions that may be associated with high inequality and low growth; we need to look for other variables that discriminate between countries in these regions.

It is well known that collinearity causes the sampling variances, standard errors and covariances of the least squares estimator to be large, implying high sampling variability, wide interval estimates and, consequently, reduced precision of the estimates. The literature points to possible correlation between physical capital investment (*INV*) and investment in human capital (*HC0*) as well as to correlation between income inequality and secondary school enrolment.⁶ This is not strongly supported by our dataset, with correlation coefficients of .24 and $-.048$ respectively. Because the coefficient on *HC0* is not significant, this is the variable we choose to drop. In doing this we follow other studies, such as Clarke (1995) and Deininger and Squire (1996). This implies that the coefficient on *GINI* includes any indirect effect of income inequality on growth through its effect on education (Knowles, 2001).

We now introduce indicators of the trade regime into specification (4.1). There is a large literature on the relationship between trade policy and growth, and the difficulties of measuring trade orientation are well known (see Edwards, 1993, 1998; Greenaway, Morgan and Wright, 1998; Milner and Morrissey, 1999; Rodrik, 1992, 1998, 1999). Given the problems of measuring openness, we use two of the more widely accepted measures. The black market premium (*BMP*, defined as [(black market rate/official rate) -1]) is a good indicator of the overall level of distortion

in the economy because it captures the deviation of the exchange rate from its market level. The second indicator is the proportion of years between 1965 and 1990 that an economy could be considered open – the Sachs–Warner index (*OPEN*). Both measures are drawn from Sachs and Warner (1997). It should be noted that few of the African economies liberalized much before 1990. The choice of the indicators is driven by their demonstrated robustness in empirical studies (Edwards, 1998; Harrison, 1996).⁷ Again, we emphasize that we are seeking to identify correlations and the results should not be interpreted as implying a causal relationship.

The results from cross-section estimation are in table 4.3, representing the addition of trade openness variables to the regressions in table 4.2. Column (1) shows that when *BMP* is included it has a negative and significant coefficient, whereas the coefficient on *GINI* becomes insignificant. This may indicate possible collinearity between *GINI* and *BMP*, although the correlation between the two is relatively low (.295). A plausible interpretation is that *BMP* and *GINI* do not always proxy for the same distortions, but they do in general. In other words, in the spirit of Birdsall, Ross and Sabot (1995), the results suggest that it is not inequality per se that retards growth but inequality is associated with the types of distortions that retard growth, and these are often captured by the *BMP*. We note in passing that, if *LAdum* is included in the regressions of table 4.3 without *SSA*, it is not significant and other coefficients are largely unaffected. If both the regional dummies are included together, the effect is as for table 4.2 (results available on request). The persistent result for the dummies is that *LAdum* is insignificant in the regressions with land inequality. The probable explanation is that growth performance is generally better in LA than in SSA. Because LA has the highest land inequality, but not the lowest growth, the regional effect is captured by *landGINI* in those regressions.⁸ Because SSA has the lowest growth, there is a regional effect independent of inequality.

The significant coefficient on *OPEN* is robust to the inclusion of *GINI* or *landGINI*. Openness appears to be conducive to growth. Note that the correlation between *GINI* and *OPEN* is very low (–.07). When *OPEN* is included on its own (3), the coefficient is positive and significant whereas the SSA dummy is negative and significant, notwithstanding the fact that SSA countries liberalized their trade regime only towards the end of our sample, hence the value of *OPEN* will be low for them. When both *OPEN* and *GINI* are included, *SSA* becomes insignificant. The results in (2) suggest that the combination of restrictive trade policies and income inequality account for the SSA effect. This is not apparent in the case of inequality in the distribution of land (5), although there are only five SSA countries in that smaller sample. The feature of SSA that retards growth

Table 4.3 Cross-section estimates with openness indicators

	Equation				
	(1)	(2)	(3)	(4)	(5)
<i>GDP0</i>	−0.0005 (−2.32)**	−0.0004 (−2.07)**	−0.0004 (−1.87)*	−0.0002 (−1.15)	−0.0002 (−1.09)
<i>INV</i>	0.31 (7.85)***	0.27 (6.13)***	0.26 (5.74)***	0.19 (4.08)***	0.17 (3.90)***
<i>SSA</i>	−1.07 (−1.95)*	−0.77 (−1.41)	−1.19 (−2.19)**	−1.81 (−3.13)***	−1.64 (−3.02)***
<i>BMP</i>	−0.85 (−2.13)**			−0.97 (−1.52)	
<i>OPEN</i>		1.95 (2.17)**	1.94 (2.48)**		1.85 (2.45)**
<i>GINI</i>	−0.03 (−1.64)	−0.04 (−2.32)**			
<i>landGINI</i>				−0.51 (−3.64)***	−0.04 (−3.57)***
Adjusted R^2	.71	.67	.66	.72	.75
<i>N</i>	44	44	44	34	34

Source: Authors' estimates.

Notes: As for table 4.2. The F -test supports the hypothesis that all coefficients are jointly significant and diagnostic tests support the specification.

is, we suggest, policy distortions associated with high inequality and low openness.

Although the explanatory power is quite acceptable for cross-country growth regressions, we would not attach too much weight to these results; significance levels are sensitive to which variables are included, a typical result of such regressions. Because *GINI* is an initial value, growth is an outcome over the whole period and trade liberalization is an event at some point during the period, the specification estimated here may be misleading. The *OPEN* variable is the proportion of the time a country was liberalized, and will be higher the earlier the country liberalized (and very low for most SSA countries). Political economy models would predict that high inequality is associated with distortions to the economy, and should discourage liberalization. These models do not, however, predict what would happen when liberalization occurs. On the one hand, one may expect that high inequality implies that the benefits of liberalization will be unevenly distributed. On the other hand, liberalization itself may be a sign that inequality (or at least the distortions induced by inequality) is being reduced. It is therefore important to try to locate the

timing of openness; hence the need for the panel approach undertaken in the next section.

3.2 Panel data (short-run) estimates

This section employs panel estimation methods to investigate whether there is a difference in the long- and short-run effects of inequality on growth, and the relationship of this to trade liberalization. A panel is constructed of five five-year time-periods running from 1970–1974 to 1990–1994. A subset of the countries in the cross-section analysis is used (determined by data availability). The indicator of the timing of trade liberalization used is the Sachs and Warner (*SW*) index, a dummy variable taking a value of 1 for each year beginning from the year when liberalization is said to have occurred and 0 before this.⁹ We also augment the Sachs–Warner index (*SWaug*) to add another five countries using our judgement of when they liberalized (see appendix table 4A.3). Investment is gross domestic investment as a percentage of GDP averaged over the five-year period (*GDIP*). The *GINI* is income inequality at the start of the five-year period, or as near to then as available (from WIID). A period dummy (*Pdum*) is used for 1980–1994, during which period most of the sample liberalized their trade regime. Starting income is measured as the log of initial GDP (*GDP0*) in each period. We do not include region dummies (*SSA* and *LAdum*) because they give rise to collinearity and prohibit estimation of the fixed effects model (we tested for the appropriate form of estimator for all panel regressions).

Results are reported in table 4.4. The coefficient on *GINI* is insignificant, in contrast to Forbes (2000), who finds these to be positive and significant. The difference in the results can be attributed to several factors, notably differences in samples, data and estimation technique (Forbes, 2000, used Generalized Method of Moments estimators, but our data are inadequate to that particular technique). In our sample there is no consistent pattern of within-country variation in inequality – some exhibit large changes, positive or negative, but most exhibit small changes – and this is one reason the variable is not significant in the panel regressions. More generally, within-country changes in inequality do not appear to be determinants of period (short-run) growth. As previously, investment (*GDIP*) is a major determinant of growth and there is evidence for convergence within the sample. We find evidence that trade liberalization, as proxied by the *SW* (or our augmented *SW*) index, is associated with higher growth. Note that the period dummy has a negative coefficient (significant only if openness indicators are included), implying that liberalization offset some other negative effect on growth.

Table 4.4 Panel regressions with Sachs–Warner indices

	Equation			
	(1)	(2)	(3)	(4)
<i>GINI</i>	0.0004 (0.96)	−0.0003 (−1.02)	0.0006 (1.29)	0.0006 (1.58)
<i>GDIP</i>	0.002 (2.62)***	0.002 (4.03)***	0.002 (3.44)***	0.002 (4.31)***
<i>GDP0</i>	−0.02 (−2.01)**	−0.008 (−3.00)***	−0.02 (−2.53)**	−0.02 (−2.81)***
<i>SW</i>		0.023 (4.76)***		
<i>SWaug</i>				0.02 (3.41)***
<i>Pdum</i>	−0.01 (−1.66)	−0.02 (−3.79)***	−0.01 (−1.58)	−0.01 (−3.06)***
Adjusted R^2	.38	.29	.40	.46
<i>N</i>	129	129	145	145

Source: Authors' estimates.

Notes: As for table 4.2. The Lagrange Multiplier test did not reject the null hypothesis that pooled least squares (POLS) is appropriate against an alternative of fixed or random effects in (2). Where appropriate, the Hausman test was used to choose between random effects (REM) and fixed effects models (FEM). Tests supported the efficiency of fixed effects models for (1), (3) and (4). Further results available on request. We experimented with initial and lagged GDI separately, but the coefficients were negative (and significant in some instances). These probably capture an initial GDP effect; hence the negative coefficient implies convergence.

This equation may be mis-specified because *GDIP* is likely to be endogenous; that is, growth is a determinant of average investment rates during each period. Endogeneity of inequality does not appear to be a problem – growth does not appear to be an influence on the change in inequality (results available on request). To address the problem of endogeneity of investment, we re-estimated the equation without investment but including initial education level (*SEC*, initial values of secondary school enrolment rates for each period) as a proxy for initial capital.¹⁰ In table 4.5 the results suggest that trade liberalization does promote growth, whereas inequality independently appears to have no short-run effect on growth. There is weak evidence of convergence and that countries with higher levels of human capital tend to exhibit higher rates of growth. There is also evidence that growth performance was generally poor in the 1980–1994 period, owing to factors not specified in our model. The only robust results are that investment (in physical or human capital) and opening up to trade are associated with higher growth, and

Table 4.5 Panel regressions excluding investment

	Equation		
	(1)	(2)	(3)
<i>GINI</i>	−0.0001 (−0.33)	−0.0001 (−0.38)	0.0003 (0.64)
<i>SEC</i>	0.0005 (2.82)***	0.0004 (2.42)**	
<i>GDP0</i>	−0.01 (−1.92)*	−0.01 (−2.42)**	−0.01 (−1.55)
<i>Pdum</i>	−0.02 (−4.74)***	−0.03 (−5.68)***	−0.02 (−3.32)***
<i>SWaug</i>		0.02 (4.11)***	0.01** (2.35)**
Adjusted R^2	.17	.24	.37
<i>N</i>	132	132	148

Source: Authors' estimates.

Notes: As for table 4.4. Tests supported the efficiency of pooled least squares for (2), whereas random effects estimates are reported in (1) and fixed effects in (3). Further results available on request.

countries with lower initial GDP tend to grow faster than other countries (the coefficient is negative).

4 Influences on inequality and poverty

The results in the previous section suggest that inequality is associated with lower growth in developing countries over the long run, although one cannot infer that inequality itself is a significant constraint on growth. Higher inequality is associated with lower growth, so initial inequality (at the start of the long-run period, around 1970) should be an indicator of poverty at the end of the period (the 1990s). If high inequality is associated with poverty, this effect should be persistent. We test this in section 4.2 below. First, we explore factors influencing differences in inequality and then in poverty across countries. We have insufficient data to consider factors influencing changes in inequality or poverty.

4.1 Differences in inequality across countries

Li, Squire and Zou (1998) identify four factors that appear to explain about three-quarters of the variation in income inequality across countries: initial schooling; civil liberties; inequality in the distribution of land;

and financial development (the ratio $M2/GDP$). All of these seem to be significant indicators of the share of income going to the poor: the higher is schooling, civil liberties, financial development and equality in the distribution of land, the higher is the share of income going to the poor. As we have a different sample and dataset, we cannot replicate Li et al.'s analysis. We posit that initial GDP captures some of the effects associated with civil liberties, and we include a measure of schooling. We then test if land inequality, trade variables and regional dummies help to explain variations in inequality.

Three of the variables deserve some explanation. As observed earlier, land inequality is significantly higher in Latin America (LA), but there is no reason to suppose that the relationship between land and income inequality is uniform across regions. Thus, we interact these two variables such that *LNDLA* captures the effect of land inequality in LA. More generally, the effect of land on income inequality should be related to relative land abundance (*NRE* measures land area per worker); thus *landNRE* interacts *landGINI* with *NRE*. Higher values imply greater inequality in land-abundant economies. We also include *SSA* and a variable to capture natural or non-policy barriers to trade (*NBT* is a measure of transport costs, higher values being a barrier to trade). The latter could be important if countries facing lower trade barriers can expand trade, thereby supporting growth, and alter the composition of trade (spreading the benefits wider and reducing inequality). For this reason, in some specifications we interact *NBT* and *OPEN*.

The results are in table 4.6. The specification explains 40–50 per cent of the variation in income inequality (in the 1990s) across the countries. Initial GDP (in 1970), schooling (*ALPC*, the percentage of the population with primary education completed) and *OPEN* are generally insignificant. Income inequality is higher in SSA and in LA (given that land inequality is higher in LA). Controlling for these regional effects, the higher are natural barriers to trade and *landNRE*, the lower is income inequality. These results appear surprising, and suggest that land inequality (in land-abundant countries) and natural barriers to trade are not necessarily determinants of income inequality. Countries that have adopted policies to address the constraints imposed by land inequality and barriers to trade (not captured directly here) have lower income inequality, and such countries do not appear to be in SSA or LA. The significant result, however, is that it is features of countries, or specifically regions, that are associated with higher income inequality. Structural features that vary across countries (income, schooling, trade barriers) do not consistently explain variations in levels of inequality. This suggests that income inequality is indeed an outcome of policy decisions rather than of structural characteristics, thereby lending support to our inter-

Table 4.6 Cross-section influences on level of inequality

	Equation			
	(1)	(2)	(3)	(4)
<i>GDP0</i>	0.23 (0.28)	0.001 (2.06)*	-0.0014 (-0.47)	0.003 (1.00)
<i>PCGROWTH</i>		0.82 (0.93)		0.52 (0.57)
<i>ALPC</i>	-0.04 (-0.14)	-0.33 (-1.31)	-0.23 (-0.82)	-0.72 (-3.29)***
<i>LNDLA</i>	0.19 (6.26)***	0.18 (3.99)***	0.20 (5.56)***	0.18 (4.90)***
<i>landNRE</i>	-0.01 (-3.93)***	-0.008 (-3.38)***	-0.01 (-3.30)***	-0.007 (-3.54)***
<i>SSA</i>	11.76 (2.55)**	11.67 (1.98)	11.97 (2.63)**	9.21 (1.72)
<i>NBT</i>	-100.87 (-3.156)***		-94.80 (-2.24)**	
<i>OPEN</i>	0.23 (0.06)		2.91 (0.84)	
<i>NBT*OPEN</i>		0.41 (0.11)		5.57 (1.98)*
Adjusted R^2	.40	.32	.46	.32
N	28	28	25	25
F (prob)	.01	.07	.01	.05
	With outliers	With outliers	No outliers	No outliers

Source: Authors' estimates.

Notes: As for table 4.2. Dependent variable is the value of *GINI* in the 1990s. *PCGROWTH* is per capita growth; *ALPC* is average percentage of primary school completed in total population, comparable to initial mean years of secondary schooling used in Li, Squire and Zou (1998); *LNDLA* is the interactive term *landGINI*LAdum*; *landNRE* is the interactive term for *landGINI*NRE*. The outliers are Argentina, Israel and Venezuela.

pretation of inequality in the previous section as capturing features of policy in a country that are associated with lower growth.

The results are clearly sensitive to outliers and to specification, i.e. they are fragile. The results for regression (4) in table 4.6 are instructive in this respect. With this combination of variables, *SSA* is no longer significant and higher education is associated with lower inequality. Because *SSA* countries tend to have a (near) zero value of *OPEN*, they will have relatively low values (typically zero) of *NBT*OPEN*. Countries with open trade policies tend to have higher income inequality if natural barriers are high. This merely reinforces the point that the relationship between trade policy and inequality is not a general one; it depends on

other factors. One factor we have identified is transport costs. The general result remains that structural features of the economy are not robust determinants of variations in levels of income inequality.

4.2 *Variations in poverty*

Adequate data on poverty are not available for all of the countries included in the previous analysis, and the data that are available provide observations only after 1985 (Hanmer and Naschold, 2001; World Bank, 2001). We constructed the following dataset. For each of 32 countries there are two observations of poverty: *POV1* (1985–1989) and *POV2* (after 1990). Observations for another two countries are available only for *POV2* (see appendix table 4A.4). The explanatory variables used are all lagged (i.e. they refer to an earlier period) and we include initial GDP, initial inequality, *OPEN* and *SSA*. We here present some exploratory analysis using these data.

The results are presented in table 4.7. The only robust result is that poverty is higher in SSA. There is fairly robust evidence, at least for *POV2*, that poverty is lower in countries with higher initial income. Although this is unsurprising, note that growth tends to have been slower in countries with higher *GDP0*, controlling for other factors, suggesting no consistent influence of growth on cross-country variations in poverty. Indeed, when growth was included as an explanatory variable, the coefficient was insignificant (see below). As we can observe only end-of-period poverty, we cannot infer that growth does not reduce poverty. However, there is also fairly robust evidence that more open countries have lower poverty, and openness is quite a consistent determinant of growth. This evidence is consistent with the argument of Fane and Warr (chapter 8 in this volume) that it is the sources of growth, accumulation and technical change, and whether in agriculture or other sectors, that determine the effect on poverty. In other words, the results are consistent with the argument that it is the pattern of growth, not growth itself, that is important for poverty.

Implicit in the cross-section approach is the assumption that the coefficient on the explanatory variables is the same for each country. It follows that we can treat each observation of poverty as independent and pool the sample (that is, we assume the coefficients on the explanatory variables are the same for each country over time, in addition to assuming the coefficients are the same for all countries). Thus, to permit a larger sample for the exploratory analysis, we pool the data. The results are in table 4.8, where *growth* refers to the difference of log GDP per capita between 1980 and 1984 for *POV1* and between 1985 and 1989 for *POV2*. The coefficient on *growth* is insignificant, supporting the arguments

Table 4.7 Cross-section influences on level of poverty

	<i>POV1</i>	<i>POV1</i>	<i>POV2</i>	<i>POV2</i>
<i>GDP0</i>	-0.001 (-2.47)**	-0.0082 (-1.364)	-0.01 (-2.77)***	-0.01 (-2.61)**
<i>GINI</i>	-0.14 (-0.39)	-0.54 (-1.91)*	-0.14 (-0.53)	-0.36 (-1.35)
<i>OPEN</i>	-13.08 (-1.79)*	-9.42 (-1.521)	-20.60 (-3.67)***	-18.27 (-3.35)***
<i>SSA</i>	27.94 (4.28)***	24.40 (4.08)***	18.03 (3.13)***	16.98 (3.28)***
Adjusted R^2	.43	.43	.46	.46
N	32	30	34	32
F (prob)	.001	.001	.0002	.0003
	With outliers	No outliers	With outliers	No outliers

Source: Authors' estimates.

Notes: Figures in parentheses are t -ratios: *** significant at 1 per cent, ** significant at 5 per cent, * significant at 10 per cent. The F -test supports the hypothesis that all coefficients are jointly significant (i.e. rejects the null that all are zero). *SEC* is not significant even if initial GDP is omitted. Diagnostic tests support the functional form used. Outliers for column 1 and column 3 are Venezuela for *GDP0* and Zambia for *GINI*, *POV1* and *POV2*. Argentina and Israel are also outliers in *GDP0* but are already omitted because of missing values for *POV1* and *POV2*.

above, but countries with higher levels of human capital tend to have lower poverty. Controlling for the other variables, SSA countries have higher levels of poverty. Inequality here appears to be negatively associated with poverty (significantly so when we omit outliers). Accounting for the tendency of poverty to be higher in SSA and lower in countries with high levels of secondary enrolment, it appears that poverty is lower in countries with high inequality. Openness appears to have no independent effect on poverty.

Our data relate only to poverty levels (there are too few observations to construct a reasonable sample for changes in poverty). Because it would take time for growth to affect poverty, and the responsiveness of poverty to growth will differ across countries, it is perhaps not surprising that we fail to find evidence that previous-period growth rates help to explain relative levels of poverty. We do find that higher levels of human capital are associated with lower poverty. To the extent that long-run growth is associated with rising levels of secondary school enrolment, this suggests a pro-poor pattern of growth (i.e. growth that reduces the poverty headcount). Similarly, a sustained relatively open trade regime also appears to be part of a pro-poor growth pattern (in table 4.7), although

Table 4.8 Influences on poverty, pooled sample

	Equation			
	(1)	(2)	(3)	(4)
<i>growth</i>	-57.26 (-1.25)	-95.36 (-1.94)*	-68.14 (-1.65)	-107.64 (-2.38)**
<i>GDP0</i>		-0.007 (-1.79)*		-0.005 (-1.85)
<i>SEC</i>	-0.53 (-3.37)***	-0.45 (-2.77)***	-0.47 (-3.74)***	-0.42 (-3.29)***
<i>GINI</i>	-0.53 (-1.6)	-0.45 (-1.38)	-0.75 (-2.52)**	-0.74 (-2.56)**
<i>OPEN</i>	-4.61 (-0.50)	-2.80 (-0.31)	1.23 (0.17)	2.91 (0.41)
<i>SSA</i>	26.92 (3.66)***	23.68 (3.21)***	27.23 (4.28)***	24.49 (3.87)***
Adjusted R^2	.52	.54	.57	.60
N	45	45	41	41
F (prob)	.00	.00	.00	.00
Estimator	POLS With outliers	POLS With outliers	POLS No outliers	POLS No outliers

Source: Authors' estimates.

Notes: As for table 4.7. Results for tests for choosing between POLS, FEM and REM are available on request. The countries excluded as outliers are Botswana, India, Jamaica and Zambia. The model was estimated with *NRE* but the coefficient was insignificant. A version with a smaller sample was estimated with *SWaug*; the coefficient was insignificant and otherwise results were similar.

this finding is not robust. Similarly, there is no robust evidence that inequality is a determinant of poverty, although poverty, like inequality, is consistently higher in SSA.

5 Conclusions

The manner in which inequality, growth and poverty are related, and whether trade policy has an influence, are important empirical questions. Income inequality tends to be associated with (or even a proxy for) inequalities in the distribution of power. High inequality will be associated with distortions in the economy, such as high levels of protection, and incentives for rent-seeking behaviour. These in turn tend to reduce growth. Thus, inequality and restrictive trade policies will tend to be correlated, at least in the long run, and both associated with lower growth. Trade liberalization is an indicator of economic policy reform in

which distortions are reduced and market incentives increased. Consequently, it should be growth promoting, but it may not have any systematic effect on inequality. In general, one expects poverty to be higher if growth is lower and/or if inequality is higher. These are the relationships we set out to explore. Ultimately, we must conclude that the empirical evidence is fragile for developing countries.

Section 3 used cross-section and panel econometric techniques to investigate the links between growth, inequality and trade liberalization. A number of general conclusions emerge from our sample of 44 developing countries for the “growth regressions”, and these are in line with the results of other studies summarized in section 2. First, inequality does tend to retard growth in the long run (there is no evidence for a short-run effect), whereas trade liberalization tends to be associated with increased growth (in both the long and short run). However, when we included the black market premium as a measure of policy distortions, the coefficient on inequality was insignificant. Similarly, the inclusion of dummies for SSA and Latin America eliminated the effect of inequality. We infer from the results that inequality captures country-specific policy features that retard growth. Other controls for policy or region can eliminate the inequality effect. Africa does appear to be different – SSA countries have a below-average growth performance that cannot be explained fully by the variables we consider, including inequality. We do find that the combination of income inequality and restrictive trade policies appears to account for the negative “SSA effect” on growth.

The four theories proposed to explain the relationship between inequality and growth in section 2 can now be evaluated against the evidence in this chapter.

- The political economy models are all premised on some version of an argument that inequality encourages redistribution policies that then reduce growth. An implication is that inequality that leads to redistribution reduces growth but should also reduce future inequality. There is no convincing evidence for this. Banerjee and Duflo (2001) find that inequality tends to change least in countries with high inequality; that is, these countries do not redistribute income to a significant degree. Redistribution is most prevalent in richer economies, for which Forbes (2000) finds that higher inequality is associated with higher growth in the short run (which is not support for these models). There is no evidence for a consistent pattern of redistribution, which may be one reason there is no consistent relationship with poverty. Our evidence is that inequality has a consistent long-run negative effect on growth in developing countries.
- Social conflict models can be considered as alternative “socio-political economy” models, in which inequality increases tension and conflict

(perhaps because it does not lead to redistribution). Conflict and social tension discourage accumulation and therefore growth. If this type of model can be interpreted as representing elite rent-seeking and corruption as social conflict measured by inequality, then this is supported by the evidence for developing countries. Higher inequality results in lower growth, and the élites behind this effect withstand pressures for redistribution.

- Credit market models are based on the observation that the poor are constrained in their ability to access credit; they therefore invest less and growth is lower. Our results do not test such hypotheses, even indirectly, although we do find that investment is a driver of growth. Future research could explore whether inequality does indeed constrain the level and/or productivity of investment.
- The X-efficiency models are appropriate to catch the direct effect of inequality in reducing incentives for effort, hence slowing dynamism and growth. Such effects should be observable in the short run, but we find no evidence for a negative short-run relationship between inequality and growth in developing countries.

We then presented an exploratory analysis of the influences on variations across countries in inequality and poverty. The only strong patterns in the data are that structural features (initial GDP, schooling, openness) do not explain cross-country variations in inequality; most of the explanatory power comes from regional dummies and land inequality (a policy rather than structural variable). We found no evidence that differences in growth rates or inequality are associated with cross-country variations in levels of poverty. However, countries with less restrictive trade policies over a sustained period and those with higher initial levels of income tend to have lower levels of poverty at the end. Again, SSA is different and exhibits higher levels of inequality and poverty.

We do not identify the factors explaining differences in levels of poverty across countries, but we do identify some factors that are important. Countries with lower levels of poverty tend to be those that invested in human capital and sustained a relatively open trade regime. In such countries, relatively high levels of inequality are not associated with relatively high levels of poverty (if anything, the reverse is the case). Thus, just as we argued that inequality per se may not be a constraint on growth, inequality itself is not a bar on reducing poverty. It is the policy distortions that tend to be associated with high levels of inequality that retard growth, and it is the patterns of growth, rather than growth itself, that determine the effect on reducing poverty. Our results also caution against concluding that a pattern of growth that reduces inequality *automatically* reduces poverty. Some countries with relatively high levels of inequality nevertheless have relatively low levels of poverty.

The major conclusion from our analysis is that the aggregate relationships between inequality, growth, trade and levels of poverty are fragile. Inequality does not appear to have a robust influence on growth that is independent of policy distortions or regional effects. Relative income levels do not explain variations in inequality across countries, and growth does not explain variations in poverty across countries. We can go beyond the simple statement that “policy matters” to state that policies rather than structural characteristics are the fundamental determinants of inequality and poverty. The types of policies that promote growth may not reduce inequality or poverty. This message is consistent with many of the papers cited in section 1 (for example, Banerjee and Duflo, 2001; Dagdeviren, van der Hoeven and Weeks, 2004; Quah, 2001; Ravallion, 2001). However, the types of policies that reduce inequality are likely to be conducive to growth. Furthermore, policies that promote growth and reduce inequality are the most likely to reduce poverty. Our results suggest two such policies, education and trade openness (the latter because it reduces distortions rather than because trade per se is good for the poor), but there are likely to be others. Cross-country analysis can be useful to identify patterns and suggest issues to focus on, but much of what happens is country specific. Future research will need to focus on individual countries to explore the patterns of growth and how these are related to inequality and poverty reduction. If we achieve no more than to convince readers to interpret cross-country evidence on inequality, growth and poverty with extreme caution and to eschew generalizations based on such evidence, we would be content.

Appendix

List of variables

GDP0 = GDP per capita in 1970

GROWTH = average real per capita growth rate over 1970–1995 period

INV = average investment to GDP ratio over 1970–1995 period

BMP = black market premium, computed as [(black market rate/official rate) – 1]

OPEN = proportion of the years between 1965 and 1990 that the economy is considered to be open by the criteria set by Sachs and Warner (1997)

HCO = secondary school enrolment rate (1970)

SEC = secondary school enrolment rate at start of period

ALPC = average percentage of primary school complete in total population

GINI = Gini coefficient of income inequality (1970 or as close as possible to 1970)

landGINI = land concentration index (Gini in 1970 or as close as possible to 1970)

SSA = dummy variable with the value of 1 for countries in sub-Saharan Africa and 0 for all others

LAdum = dummy variable with the value of 1 for countries in Latin America and the Caribbean region and 0 for all others

POV1 = average headcount index (% below US\$1 per day PPP 1993) 1985–1989

POV2 = average headcount index 1990–1994

LNDLA = interactive term *landGINI***LAdum*

landNRE = interactive term for *landGINI***NRE*

GDIP = average period investment to GDP ratio

Pdum = dummy variable with the value of 1 for period 1980–1994

SW = dummy capturing Sachs and Warner openness indicator, taking value of 1 when countries liberalized

SWaug = augmented *SW* index using our judgement of when five countries liberalized

NBT = CIF/FOB factor

Data sources

Sources are *World Development Indicators 1997* and *2000* (CD-ROM); Barro–Lee dataset; World Income Inequality Database (WIID); Sachs and Warner (1997); IFAD (2001) for *landGINI*; *International Financial Statistics Yearbook 1995* (CIF/FOB factor).

Table 4A.1 Descriptive summary statistics

Series	<i>N</i>	Mean	Std dev	Minimum	Maximum
<i>GDP0</i>	44	1052.7	1100.8	92.2288	5736.6
<i>GINI</i>	44	46.8132	11.4625	27.9	79.5
<i>HCO</i>	44	25.5682	14.9688	1.000	59.000
<i>INV</i>	44	21.7489	5.5350	10.5600	35.45

Table 4A.2 Regional variations in inequality

	<i>SSA</i>	<i>LA</i>	<i>Others</i>	<i>All</i>
<i>Income Gini</i>				
Mean	54.12	49.14	39.63	46.81
Std dev	13.76	8.28	9.39	11.46
<i>N</i>	10	18	16	44
<i>Land Gini</i>				
Mean	62.5	81.86	53.04	67.15
Std dev	15.15	4.35	13.85	17.25
<i>N</i>	5	15	14	34

Source: Authors' summary of raw data.

Table 4A.3 Additional countries for augmented Sachs–Warner index

	1970–1974	1975–1979	1980–1984	1985–1989	1990–1994
Egypt	0	0	0	0	1
Nepal	0	0	0	0	1
Madagascar	0	0	0	1	1
Nigeria	0	0	0	1	0
Turkey	0	0	0	1	1

Source: Authors' judgement of when countries liberalized on a review of their trade policy.

Table 4A.4 Sample and data on Gini and poverty

Country	<i>GINI</i>	<i>LandGINI</i>	<i>DiffGINI</i>	<i>POV1</i>	<i>POV2</i>
Botswana	57.40		−9.40	33.00	15.42
Egypt	35.00	45.87	−3.00		
Nepal	53.00	57.00	36.70	42.13	39.77
Kenya	47.90	68.41	9.60	45.76	33.54
Madagascar	39.10	80.40	4.34	49.18	60.17
Niger	29.20		21.30	65.72	57.80
Nigeria	60.34		−22.87		52.17
Senegal	51.30	49.27	2.82	58.08	32.63
Sierra Leone	61.17	44.32	1.73		
South Africa	53.00	70.10	6.00		11.47
Tunisia	50.19	64.56	−9.19	1.67	1.26
Zambia	79.50		−27.10	87.49	63.88
Zimbabwe	62.30		−9.44	40.46	35.95
Costa Rica	50.00	81.33	−3.00	18.90	10.32
Dominican Rep.	49.28	81.97	1.61	7.73	3.19
El Salvador	46.53	80.97	−0.53		
Guatemala	29.96	84.84	29.54	43.43	51.37
Honduras	44.23	77.88	9.47	44.67	41.35
Jamaica	41.272	80.59	−3.35	4.58	3.08
Mexico	45.54	74.70	8.16	12.05	15.61
Panama	57.00	77.78	−0.20	16.57	14.95
Argentina	35.30	87.30	10.70		
Bolivia	53.00		−1.00	10.70	11.28
Brazil	57.61	85.21	2.49	18.41	13.19
Chile	46.00		10.50	10.20	5.45
Colombia	52.02	85.92	5.18	4.47	2.82
Ecuador	62.50	81.55	−11.18	24.85	24.55
Guyana	56.16		−15.94		
Thailand	42.63		6.17	25.91	4.11
Peru	59.41	76.60	13.21	1.14	12.31
Uruguay	49.68	80.34	−7.60		
Venezuela	49.00	90.96	−2.20	7.55	8.93
Bangladesh	34.34	41.87	−6.04	27.86	32.47
China	27.90	21.10	−8.31	11.11	17.10

Table 4A.4 (cont.)

Country	<i>GINI</i>	<i>LandGINI</i>	<i>DiffGINI</i>	<i>POV1</i>	<i>POV2</i>
Hong Kong	43.00		9.00		
India	30.38	61.44	−0.68	72.96	44.21
Indonesia	34.60	55.59	2.44	28.08	16.32
Israel	30.87	75.49	−0.31		
Turkey	56.00	57.79	−5.00		
Korea	33.30	35.12	1.66		
Malaysia	50.00	58.26	−1.65	12.69	4.30
Pakistan	32.30	50.81	−1.10	49.63	37.54
Philippines	49.41	50.93	0.19	20.53	16.15
Sri Lanka	31.16	66.70	−5.44	9.39	5.19

Sources: *GINI* from WIID; *landGINI* from IFAD (2001); *POV1* and *POV2* from World Bank (2001); Hanmer and Naschold (2001).

Notes: *GINI* is the initial value (nearest to 1970); *DiffGINI* is the change in Gini coefficient over the 1970–1994 period.

Notes

1. A number of recent studies provide evidence for the latter effect in SSA. Gyimah-Brempong and Traynor (1999) find that political instability has a direct negative effect on growth and also an indirect effect via discouraging accumulation. Guillaumont, Guillaumont-Jeanney and Brun (1999) find that SSA has higher levels of primary instabilities (political, climatic and terms of trade) than other developing country regions, and this reduces growth by distorting economic policy so that the rate of investment is volatile, thus the growth rate is lowered.
2. This may be one reason donors now place a “pro-poor orientation” so high on the agenda for aid and debt relief. Arguably, such external funding of expenditures targeted on the poor obviates, or at least postpones, the need for redistributing domestic resources.
3. This paper provides a discussion of the criteria for selecting and cleaning the data and a critical discussion of the data used in earlier studies. Knowles (2001) provides a critical discussion of these data, demonstrating that the use of income- as against expenditure-based measures biases the results.
4. We tried alternative human capital measures, such as average years of schooling, but the results were unaffected.
5. These results can be compared with an earlier version (Mbabazi, Morrissey and Milner, 2001), which did not incorporate a Latin America dummy or land inequality. Omitting these resulted in more significant effects of inequality on growth.
6. Indeed, Li, Squire and Zou (1998) found that higher values of initial schooling and civil liberties were strongly associated with lower levels of inequality. Because initial GDP seems to capture the schooling effect in our sample, inequality may be capturing the restrictive political regime, at least in part.
7. Dollar and Kraay (2001), in a study with a similar focus to ours, use a trade volume measure to capture trade policy. The disadvantage with their approach is that one must infer policy from observed volume changes (which may be attributable to non-policy factors in an unsystematic way). As our concern is to capture the *signal* of trade policy

change, the openness measure used here (and the timing of liberalization measure used below) is appropriate, if imperfect.

8. If Argentina, Israel and Venezuela are excluded from the sample (as outliers on *GDP0*), the coefficient on *GINI* in (2) becomes insignificant, although other results in table 4.3 are largely unaffected.
9. We are grateful to Peter Wright for providing the data. We also tried the World Bank and Dean indicators used in Greenaway, Morgan and Wright (1998), but the coefficient was insignificant in almost all specifications.
10. We also tried alternative measures of human capital, but the coefficients were never significant.

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Convergence clubs in cross-country life expectancy dynamics

David Mayer-Foulkes

1 Introduction

Can “development” and “underdevelopment” be defined as specific economic states? Is it possible that whole sets of countries find themselves in particular types of dynamic equilibria that determine the type and extent of their growth? This is the kind of question that was addressed when development theory originated. However, the difficulties faced by development policy in practice led to the current restricted focus on poverty and on balanced macroeconomics and open trade and investment policies. Although it is hoped that these policies will lead to growth and lift billions out of misery, they are really based not on a theory of development but on basic general recommendations dealing with poverty and growth that in principle apply to any country.

The main reason behind this uniformity of policy is that neoclassical growth theory, on which most current policy recommendations are based, tends to consider growth to be a uniform process, leading on its own towards the convergence of income levels, particularly if policies allow markets to function. Recent empirical work, however, questions the neoclassical theory by stressing the role that productivity differences play in explaining income differentials between countries (Klenow and Rodríguez-Clare, 1997; Hall and Jones, 1999). Howitt and Aghion (1998) develop a theory of growth that goes beyond Solow in that it gives an endogenous account of technological change. Howitt (2000) develops a

multi-country model that accounts for the endogenous nature of technological change. Howitt and Mayer-Foulkes (2002) extend this model to explain the divergence in per capita income that took place between countries during the twentieth century (documented by Pritchett, 1997), as well as the convergence that took place between the richest countries during the second half of the century. Their model implies the existence of three convergence clubs. Those in the highest club will converge to a steady state in research and development (R&D), whereas those in the intermediate club will converge to an “implementation” steady state. Countries in both of these clubs will grow at the same rate in the long run as a result of technology transfer, but inequality of per capita income between the two clubs will increase during the transition to the steady state. Countries in the lowest club will stagnate; that is, they will grow at a slower rate, with relative incomes falling asymptotically to zero. Once R&D has been introduced, a country may have only a finite window of opportunity in which to introduce the institutions that support R&D, after which it will remain trapped in an implementation or stagnation equilibrium. The model implies that a series of factors known to slow growth, such as ineffective property rights, excessive taxes, weak financial and monetary institutions, corruption and lack of public services (Easterly, 2001), can determine whether a country remains in a stagnation or implementation steady state. The importance of human capital as an input for both production and technological change coincides with a recent emphasis on human development.

Broadly speaking, this and other growth models with multiple steady states – and therefore convergence clubs – present a paradigm allowing for the definition of *states of development*. In the Howitt and Mayer-Foulkes (2002) framework, developed countries are those carrying out R&D, and there are two kinds of underdeveloped countries: those implementing current technological advances and those in stagnation. Finer characterizations are possible with models incorporating other relevant economic phenomena, such as trade, or other sources of multiple steady states, for instance human capital dynamics (Azariadis and Drazen, 1990; Benabou, 1996; Durlauf, 1993, 1996; Galor and Tsiddon, 1997; Galor and Zeira, 1993; Tsiddon, 1992). Specific health phenomena leading or contributing to convergence clubs may also be involved. To begin with the efficiency theory of wages (for example, Dasgupta and Ray, 1986; Dasgupta, 1991) implies the possibility of a low-productivity, low-nutrition trap. An intergenerational low-education, low-health and low-nutrition trap is also possible (Galor and Mayer-Foulkes, 2002), and may persist even after some minimal level of nutrition is achieved. It is likely that several types of human capital problems, in fertility, nutrition, sanitary conditions, health, education, and so on, present themselves together and

give rise to a cross-country convergence club structure that can be characterized in general terms as a human development barrier.

In the language of dynamics, countries can be defined to be in a specific state of development if their growth dynamics lie in the basin of attraction of a specific configuration of economic growth. Conversely, empirical evidence that growth dynamics possess convergence clubs implies that growth is occurring through a process involving multiple steady states. It must be stressed that the concept of convergence clubs is quite different from simply assigning different steady states to each country, because it considers that qualitatively *different* economic processes dominate in each club. Moreover, each country may have its own steady state within each convergence club. A fuller knowledge of the underlying economics can lead to policies specifically aimed at overcoming technological and other growth traps and therefore at changing states of development.

A budding literature exists on convergence clubs. In cross-country studies of income distribution dynamics, Quah (1996, 1997) finds little convergence. Instead, he finds persistence, immobility, polarization and an emerging twin-peaked income distribution since the 1980s.¹ Desdoigts (1999) finds cross-country evidence for a non-linear association of higher stages of development with higher stages of growth. Engelbrecht and Kelsen (1999) find that the Asia-Pacific Economic Cooperation (APEC) countries have different convergence properties from the Organisation for Economic Co-operation and Development (OECD) and European Union groups of economies. Andrés and Bosca (2000) find evidence for convergence clubs within the OECD. There are also some country-specific studies showing, for instance, that Ireland (O'Rourke and Grada, 1994) and New Zealand (Greasley and Oxley, 2000) do not grow as fast as groups of countries thought to be their natural convergence partners.

Convergence clubs may be at the root of the evolution of income inequality, because most income inequality is between countries and thus depends on relative growth (Quah, 2001), and growth tends to increase incomes within countries proportionally (Dollar and Kraay, 2001, 2002). Establishing the existence of convergence clubs empirically may thus play a crucial role in understanding the problems and setting out the appropriate policies for development. The purpose of this chapter is twofold. The first is to establish the existence of three large-scale convergence clusters in life expectancy dynamics during the period 1962–1997. I define a convergence cluster as a group of countries whose trajectories are significantly distinct from those in other clusters and that have the property of within-group convergence. This concept is an empirical counterpart of “convergence clubs”, in which the mechanisms giving rise to the club structure have not been determined. In addition, a cluster may

consist of a group of countries identified with a club or steady state, or alternatively of a group of countries transiting between two clubs or steady states. The presence of two or three convergence clusters is evidence for the existence of at least two clubs.

The second purpose of this chapter is to show that only growth theories with multiple steady states are consistent with these life expectancy dynamics. To do this I first show that life expectancy dynamics can be modelled using the theories of economic growth, and that they must reflect the convergence club structure of any underlying theory. Then I show that the data support the existence of at least three large-scale convergence clusters. The first has very low levels of life expectancy to this day, and thus roughly corresponds to the concept of stagnating countries. The second group had very low levels of life expectancy in 1962, but these nevertheless rose quickly. The group thus consists of countries achieving the implementation of basic technologies for the population as a whole; they may be transiting to a higher equilibrium, for example from stagnation to implementation, having broken through a human development barrier. The third group consists of countries that already had relatively high life expectancies in 1962. It comprises developed nations and a top layer of underdeveloped countries, and invites further subdivision, which could correspond to innovation types such as R&D and implementation. This is carried out in Mayer-Foulkes (2002).

Life expectancy is one of the best widely available indicators of population welfare. In fact, its five-yearly data are more complete than those for either income or education. Life expectancy is influenced by the general availability of private and public goods and services that cover basic needs and provide the technological inputs and social organization for health. Since freedom from disease and premature death is amongst the main human aims at both the individual and social levels (Sen, 1999), life expectancy attainment is an excellent indicator of population-wide development. Its importance has been recognized by its inclusion in the Human Development Index (which also includes education and income).

Recent research has found that the links between life expectancy and income are very close. In a cross-country study, Preston (1975) showed that life expectancy is positively correlated with income: higher levels of life expectancy were achieved for equivalent levels of income in later periods. Pritchett and Summers (1996) carefully corroborate by means of instrumental variable techniques that countries with higher incomes enjoy higher health, suggesting, as Anand and Ravallion (1993) find, that the main causal channels of this relationship are the income levels of the poor and public expenditure in health care. There is also a causal relation from health to income. Fogel (1994) finds that increased nutrition and health account for up to a third of the economic growth in the United

Kingdom during the past 200 years. Macroeconomic studies of economic growth, such as Barro's (1991), have found life expectancy to be an important predictor of economic growth. In more recent work, Mayer-Foulkes (2001) shows that health indicators are associated with a long-term impact on economic growth in Latin America during the period 1950–1990. Arora (2001) finds co-integration between economic growth and health in 100–125-year time-series for seven advanced countries, with growth responding to the changes in health and not vice versa. There has also been intense microeconomic research on the role of health and on nutrition investment and returns (Savedoff and Schultz, 2000; Schultz, 1992, 1997, 1999; Strauss and Thomas, 1998; Thomas, Schoeni and Strauss, 1996; amongst many others), although the magnitudes found for the health impacts tend to be smaller than those measured macroeconomically. Height and weight, as indicators of population health, have been established as standard-of-living indicators that rival aggregate measures of income (for example, Steckel, 1995). These are well known to be causally interlinked with life expectancy (Fogel, 1994).

Life expectancy is thus an excellent measure of the standard of living. As a measure of population welfare it is probably better than income. It is less sensitive to inequality (the longevity of the rich is less than proportional to their wealth), and its production requires, in addition to capital, a richer mix of public services and technology. In contrast, significant portions of the income of many underdeveloped countries have tended to be associated with a small number of sectors applying a limited spectrum of technologies.² Health may thus index the fundamentals of development better than income per capita, explaining why the macroeconomic causal impact of health indicators on income is found to be larger than the corresponding microeconomic relationships. Health measures are also closely correlated with education (Savedoff and Schultz, 2000; Schultz, 1997, 1999) and thus are good indicators of human development, an ever more important ingredient for productivity. Besides this, data for health are available for many more countries over longer periods than are data for income. This provides an opportunity for testing economic growth models by using health data.

Based on the close association of health with income and growth, I take the theoretical viewpoint, in the cross-country context, that life expectancy can be modelled using the theories of economic growth. I model health as a function of the main underlying economic variables, namely capital and technology, much like income is. For concrete examples I use both the Solow (1957) model and the Howitt and Mayer-Foulkes (2002) endogenous technology convergence club model. Expressed in these models as a function of capital per head and technology, life expectancy thus provides an indirect measure of the underlying variables. It will

follow that, when an economy converges to a steady state, life expectancy will converge to a corresponding trajectory, and that, if several steady states exist, then several such life expectancy trajectories will exist. In addition, if relative convergence holds among economies tending to the same steady state, life expectancy will inherit the same property. Thus, each of these two theories of growth, as well as any other that could be applied to life expectancy, predicts a qualitative property of life expectancy dynamics. The Solow model predicts a single convergence club, whereas the Howitt and Mayer-Foulkes model predicts multiple convergence clubs. Thus, testing life expectancy dynamics for convergence clubs is in effect a test of the qualitative predictions of these growth models. Finding that life expectancy dynamics exhibit convergence clubs implies that only growth models predicting convergence clubs can be valid. My qualitative test of the Solow and Howitt and Mayer-Foulkes models (which applies to most growth models) thus consists of a test of the descriptive properties of life expectancy dynamics.

The empirical study uses the cross-country life expectancy database by Easterly and Sewadeh that is available on the World Bank web page.³ A complete five-year panel is available for the period 1962–1997 for 159 countries.⁴ I first invite the reader to a visual examination of the life expectancy histograms for each of the years in the panel. A changing two-peaked pattern is clearly apparent. In 1962, half of the countries formed a low peak and the other half a high peak. By 1997, half of the countries in the low peak had migrated to the high peak, and the peak structure had shifted about five years to the right along the life expectancy axis (fig. 5.1).⁵ On the basis of these histograms, I define three sets of countries according to their life expectancy trajectories: “low–low” (LL), “low–high” (LH), “high–high” (HH). I then propose these three sets as possible convergence clusters and proceed to analyse the trajectory levels and their convergence properties. First I show by means of a series of summary statistics and graphs that this subdivision reflects different development processes and does not result from the multi-peakedness of the birth rate, an important parameter in growth models. To analyse the levels I show, using an *F*-test applied to quadratic estimates of log life expectancy, that a three-cluster model (which must correspond to at least two clubs) is much better than the single-cluster model (for which there can be only a single club). To analyse the convergence properties, I use *F*-tests to show that three-cluster models for both the level and change in life expectancy fit the data better than single-cluster models. Some of these tests use fixed effects and thus show that the convergence clusters share properties *independently* of country-specific steady-state levels, such as their long-term steady-state growth rates and their rates of convergence. The visual and statistical examination of the data clearly shows

that the process of life expectancy improvement in these three groups of countries was quite different, and that each subdivision of the sample enjoys the properties of a convergence cluster. Section 2 contains the theory, section 3 the empirical work and section 4 the conclusions.

2 Growth theories and life expectancy

As mentioned above, there is strong evidence that life expectancy rises with income and that, as a result of technological progress, higher life expectancies have been obtained at later dates for the same income. In addition, there is evidence that health itself increases productivity, through a series of mechanisms including increased labour, educational and household productivity and female economic participation. This and other research on health has led to the concept of health capital as an extension of human capital, consisting mainly of education (see, for example, Savedoff and Schultz, 2000).

For my Solow model, I broaden the notion of capital to include physical, human and health capital. Then the Solow model of economic growth with exogenous technological change for each country may be written as:

$$k' = s\Phi k^\alpha - (n + \delta + g)k \quad (5.1)$$

$$A_{\text{World}'} = gA_{\text{World}}, \quad (5.2)$$

where k is capital per effective worker, s is the saving rate, Φ is a country-specific fixed productivity factor, α is the elasticity of a Cobb–Douglas production function,⁶ n is the population growth rate, δ is the depreciation rate and g is the rate of growth of A_{World} , the globally available level of technology. I now suppose that health, measured by life expectancy and denoted by v (for vitality), is given by

$$v = \Psi k^\theta A^\varphi, \quad (5.3)$$

where $\theta \geq 0$, $\varphi \geq 0$ and $\theta + \varphi < 1$ in order that life expectancy increases less than proportionally with income. This expression includes the idea that health depends on the consumption stream and also that capital and technology are among the main inputs for health. Ψ represents a country-specific factor indicating how much health is produced at a given level of capital and technology. It includes such factors as preferences for health, inequities in the distribution of income and the equity, level and efficiency of public policy. Note that income is given by Ak^α , so that v can be viewed as partly or wholly a function of income, according to the reader's preferences. The expression for v would arise under Cobb–Douglas

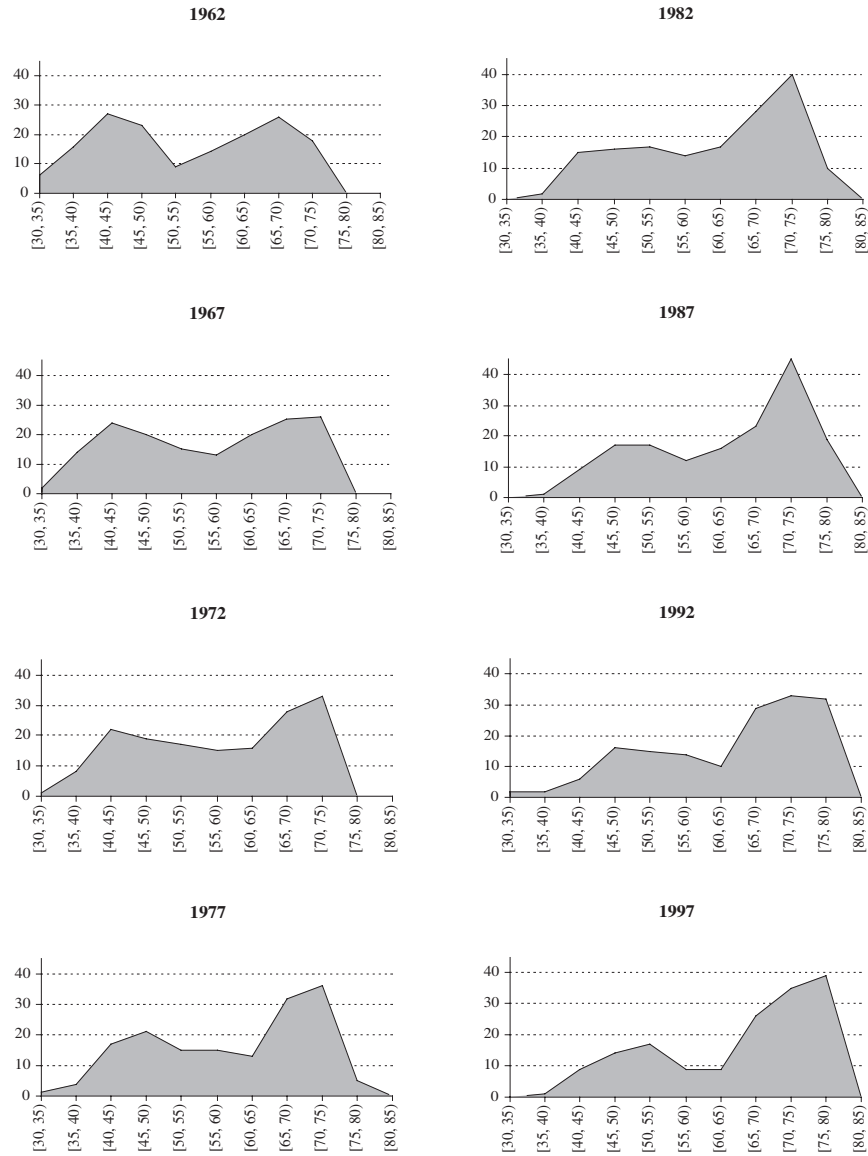


Figure 5.1 Cross-country life expectancy histograms, 1962–1997

preferences if these imply that a constant proportion of income is spent on health and if health is a homogeneous function of order $\theta + \varphi$ of expenditure on health.

The Howitt and Mayer-Foulkes model is based on the premise that a new method for creating technological change, “research and development”, was introduced early in the twentieth century. In order to take advantage of this method, a country must have (a) an appropriate set of supporting institutions and (b) a minimum threshold level of human capital that depends on the technological frontier. Countries that do not fulfil both of these requirements can create new technologies only through an older method, “implementation”. Here I do not report the fairly complex framework used to model technological change, but state only the closed-form equations that hold about each steady state:⁷

$$h' = s\Phi h^\beta - (n + \delta + \pi_+(\psi, h, \lambda)(a^{-1} - 1))h \quad (5.4)$$

$$a' = \pi_+(\psi, h, \lambda)(1 - a) - ag_{\text{World}}, \quad (5.5)$$

where h is human capital per effective worker, ψ is a country-specific index for the incentives to innovate, $\pi(\psi, h, \lambda)$ is the intensity of successful innovation, an increasing function of ψ , h and λ , the productivity of the innovation technology characterizing the stationary state, either R&D or implementation. If the incentives for innovation are too small, as in the case of stagnation, π may be negative and is replaced by $\pi_+ = \max[\pi, 0]$. In this model $a = A/A_{\text{World}}$ is the relative technological level of each country, defined with respect to the global leading edge technological parameter A_{World} . A is the average technological level of the intermediate goods industries. A_{World} is the maximum of the country-specific A s and grows at a rate g_{World} , given by the technological spillovers of worldwide innovation through R&D and implementation. As mentioned above, R&D is possible only if the per capita level of human capital is above a certain threshold, which rises with the leading technological edge A_{Max} . Thus the productivity of innovation is

$$\lambda = \lambda_{\text{R\&D}} \quad \text{for } ha \geq \eta \quad \text{and } \lambda = \lambda_{\text{Imp}} \quad \text{for } ha < \eta, \quad (5.6)$$

where η is the *innovation effective* human capital threshold and $\lambda_{\text{R\&D}} > \lambda_{\text{Imp}}$, indicating that innovation is more productive through R&D than through implementation.

We suppose as before that health is given by

$$v = \Psi h^\theta A^\varphi. \quad (5.7)$$

Physical capital, which has been excluded for simplicity, can be added to this model. The convergence club structure is retained, although steady-state levels may depend on whether the economy is open or

closed. Note that equation (5.1) in the Solow model is analogous to equation (5.4) in the Howitt and Mayer-Foulkes model, with the rate of technological growth replaced by the endogenous rate $\pi_+(\psi, h, \lambda)(a^{-1} - 1)$.

Each of the steady states of these two models (and, generically, those of any steady state of any model) has the property that as trajectories approach the steady states they do so at an exponential rate given by the absolute value of some largest eigenvalue, $-\mu$, which is negative, depends on the parameters of the model and may be steady-state specific. Using the same arguments as Barro and Sala i Martin (1990), a log-linearization at each steady state implies that the normalization

$$\underline{v} = v/(A_{\text{World}})^{\varphi} = \Psi h^{\theta} a^{\varphi} \text{ or } \Psi k^{\theta} a^{\varphi} \quad (5.8)$$

converges exponentially to its steady state \underline{v}^* . Hence

$$\log[\underline{v}(t)] = \log[\underline{v}(0)] \exp(-\mu t) + \log(\underline{v}^*)[1 - \exp(-\mu t)]. \quad (5.9)$$

This implies that the non-normalized quantity v satisfies

$$(1/T) \log[v(t+T)/v(t)] = \varphi g + (1/T)[1 - \exp(-\mu T)][\log(\underline{v}^*) - \log(\underline{v}(t))] \quad (5.10)$$

$$= \varphi g + (1/T)[1 - \exp(-\mu T)][\log(\underline{v}^*) - \{\log(v(t)) + \log(A_{\text{World}}(0)) + \varphi g t\}] \quad (5.11)$$

(with g replaced by g_{World} in the case of the Howitt and Mayer-Foulkes model). This is the basic equation describing relative convergence that I estimate. The convergence coefficient is $-(1/T)[1 - \exp(-\mu T)]$. A term involving time appears because of the dependence of v on the leading technological edge.

This equation would be satisfied by life expectancy v generically near any steady state of any model including capital or human capital also modelling v through equations (5.3) and (5.7).

In expression (5.11), \underline{v}^* is an unknown quantity that depends on the parameters s, Φ, α or $\beta, n, \delta, \Psi, \theta, \varphi, \psi, \lambda$ and g or g_{World} . λ is a steady-state specific parameter, and g and g_{World} are global parameters. The technology parameters $\alpha, \beta, \theta, \varphi, \delta$ are usually thought of as global. The remaining parameters s, Φ, n, Ψ, ψ are country specific. Through the term including the steady-state level \underline{v}^* , they give rise to fixed effects reflecting different conditions in each country. Under the three-cluster models the fixed effects have single-peaked distributions for each proposed convergence club. On the other hand, they have multiple-peaked distributions

under single-cluster models. It is verified separately that the distribution of the population growth rate n is single-peaked. Thus the three-cluster models are consistent with the point of view that the multiple-peakedness of life expectancy is an overridingly economic phenomenon. In contrast, for single-cluster models the multiple-peakedness of the fixed effects remains to be explained and would have to arise from institutional or economic policy considerations or from other reasons outside economics.

Equation (5.11) is steady-state specific. If data from several steady states are pooled together, the resulting convergence coefficient will still be negative. If a dataset is partitioned into several subsamples, a better estimate of equation (5.11) may result if the subsamples contain countries belonging to different steady states for which equation (5.11) has different coefficients. However, the boundaries of these subsamples may be imprecise and further subdivision may still be possible. Note that when referring to relative convergence the assumption of a single club is usually made. Here I am explicit about the possibility of different clubs and regard relative convergence as a club-specific property.

We now have as examples two models of life expectancy based on the dynamics of the fundamental economic variables. Life expectancy works as an indicator of each country's economic state. It is quite clear that the arguments above are applicable to most if not all other dynamic models of capital and technology. Ramsey-type growth models lead to convergence equations such as (5.11). Two-sector models with physical capital and human capital (representing knowledge rather than skill) also exhibit convergence to their steady states, so that life expectancy expressed as a function of capital and knowledge would similarly converge to a steady-state trajectory.

Indicator functions (such as life expectancy in this case) have been used to study chaotic dynamics because generically they contain all of the information on the qualitative properties of the dynamical system. This is the content of Takens' (1980) theorem, which applied in this context to discrete models of economic growth says the following: generically, the dynamics of any attractor of any m -dimensional growth model will be qualitatively reproduced by the dynamics of m -histories of life expectancy $(LE_{t-(m-1)\tau}, \dots, LE_t)$, for any lag τ .

Thus the model for the convergence of life expectancy, to one or to several steady states according to an underlying theory of economic growth, is quite general and gives rise to a formal test of the qualitative properties that growth models must have to be consistent with the descriptive properties of life expectancy dynamics. I concentrate on comparing the hypothesis that there is a single convergence club or several convergence clubs, each possessing the property of relative convergence. In the examination of life expectancy dynamics I find that ignoring the

existence of a club structure, either in a description of the levels or in a relative convergence test, involves a significant specification error, which is detected by omitted variables tests, and a failure to explain the multiple-peakedness of fixed effects.

3 Empirical dynamics of life expectancy

3.1 Life expectancy histograms

Figure 5.1, presented earlier, shows the distribution of life expectancy across the 159 countries for which a balanced panel is available. In 1962 and 1997 these histograms have a well-defined twin-peaked structure. However, the size of these peaks is different. As can be ascertained by observing the full sequence of histograms, a group of countries has travelled from the lower to the higher peak. Also, both peaks have shifted about five years to the right. In 1962, about half the countries in the sample were in the lower peak. The median life expectancy of 54.865 years lies right in between the two peaks. By 1997, about half of the countries in the lower peak had moved beyond this reference level.⁸

The histogram motivates the definition of the subsamples LL, LH and HH as follows. LL is the set of countries with life expectancy less than the median 54.865 in 1962 and also less than this level in 1997. LH are those countries that were below this level in 1962 and above it in 1997. The HH countries were above this level at both dates. Table 5.1 shows the composition of the three subsamples by region. Figure 5.2 shows a ± 3 standard deviation band for the estimated mean log life expectancy of each subsample (transformed back into years).⁹ The results confirm the life expectancy trends of the three subsamples, which are visually evident in the sequence of histograms.

Table 5.1 Composition of the three clusters by region

Cluster	East Asia Pacific	Sub-Saharan Africa	Latin America and Caribbean	Europe and North America	Middle East, North Africa and South Asia	Total
Low-Low	2	35	1	0	2	40
Low-High	8	10	8	1	15	42
High-High	13	2	21	38	7	81
Total	23	47	30	39	24	163

Source: Author's compilation.

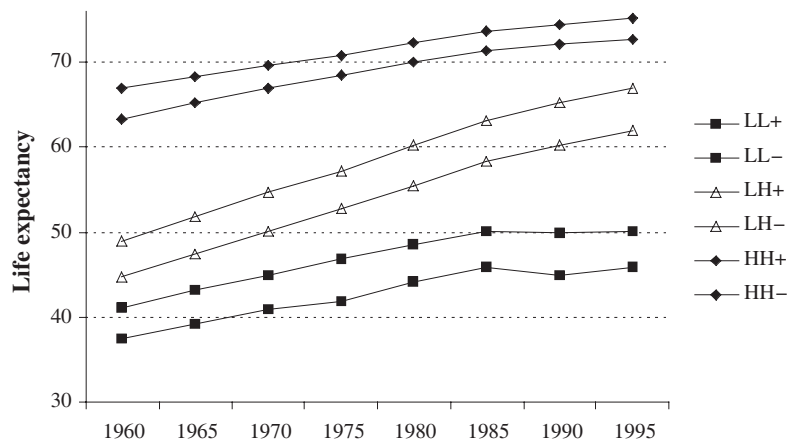


Figure 5.2 Location of mean life expectancy by convergence cluster
Note: To three standard deviations; see text.

Examination of these groups shows that the LL countries are located mainly in SSA. HH includes Europe and North America as well as 13 countries in East Asia Pacific and 21 countries in Latin America and the Caribbean (thus picking up the developed world as well as an upper layer of underdeveloped countries). LH countries include the rest of the underdeveloped world.

The mean life expectancy for LL countries is 39.5 in 1962, rising to 48.2 by 1997. These countries had very low income and technology levels in the 1960s, and improved only very slowly through the 35-year period. LH countries improved much more rapidly, from an initial 46.9 to 64.6 years of life expectancy. The initial life expectancy is still at a very low level, corresponding to very low income and technology levels, but the final level can be attained only on the basis of sufficient private and public health inputs. HH countries improved from 65.4 to 74.1 years, indicating at least an intermediate technological level throughout.

3.2 *Some issues on the choice of subsamples*

Changes in life expectancy over the period 1962–1997 can be seen in figure 5.3, which examines these changes by countries and by continents, and also shows where the LL, LH and HH subsamples lie. It is quite clear that the full sample does not consist of a simple single-humped distribution. I have not attempted to subdivide the HH group into convergence clusters, considering that other data or methods may be required. Before

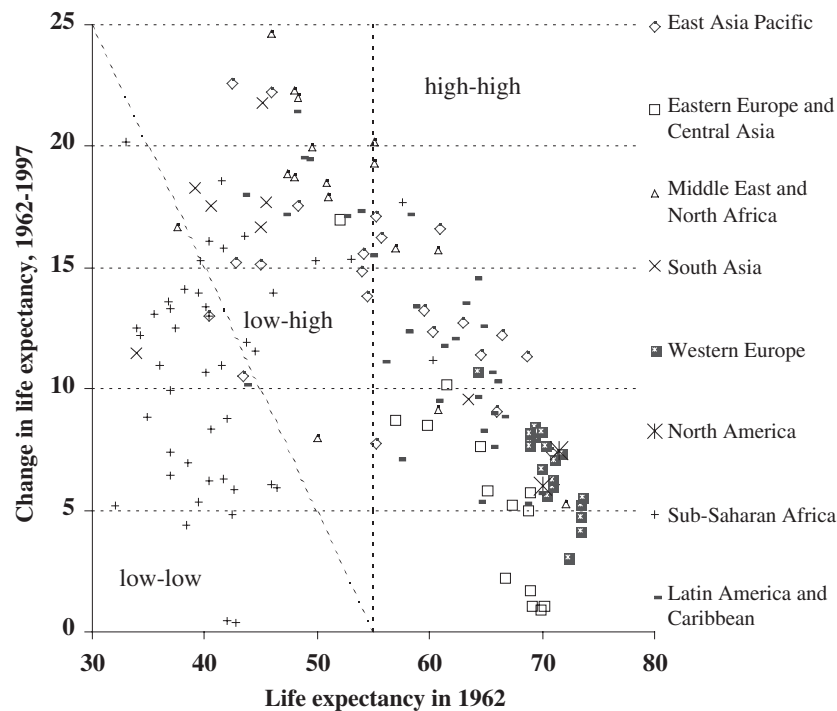


Figure 5.3 Life expectancy improvement from 1962 to 1997

examining the dynamics of these subsamples, I discuss some issues regarding their choice.¹⁰

The division of the sample of countries into low and high life expectancy groups in 1962 is not too arbitrary because the distribution is double-peaked and the median lies right in between the peaks, especially as shown in a more finely subdivided histogram. On the other hand, the boundaries between the LL and LH groups may seem somewhat arbitrary. It may appear that the choice introduces selection bias in the level analysis, because these groups are defined on the basis of their ex post performance in life expectancy improvement. However, the main point is that the life expectancy of countries starting at a low level *diverges*. Figures 5.4(a) and 5.4(b) show the life expectancy histograms for the LL and LH groups in 1962 and 1997. The two distributions clearly diverge,¹¹ something that does not depend on the exact location of the boundary. If anything, some of the lower LH countries should be classified as LL countries, making the divergence between the two subsamples even larger. Further evidence of the differences between the samples is found

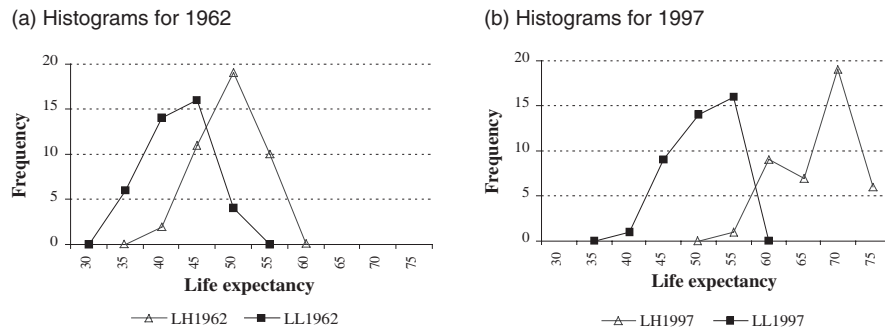


Figure 5.4 Life expectancy for LH and LL countries

in figures 5.5(a) and 5.5(b), which show the average evolution of life expectancy for the full sample and for the three subsamples.¹² Figure 5.5(a) shows that life expectancy improvements have diminished through the years. However, as can be seen in figure 5.5(b), this cannot be explained simply by diminishing returns to expenditure in health. For example, LH countries improved their life expectancy more in 1962–1967 than LL countries did in 1992–1997 at very similar life expectancy levels, even after 30 years of technological improvements! It is also apparent that the experience of each group of countries does not lie in the neighbourhood of the average cross-country performance.

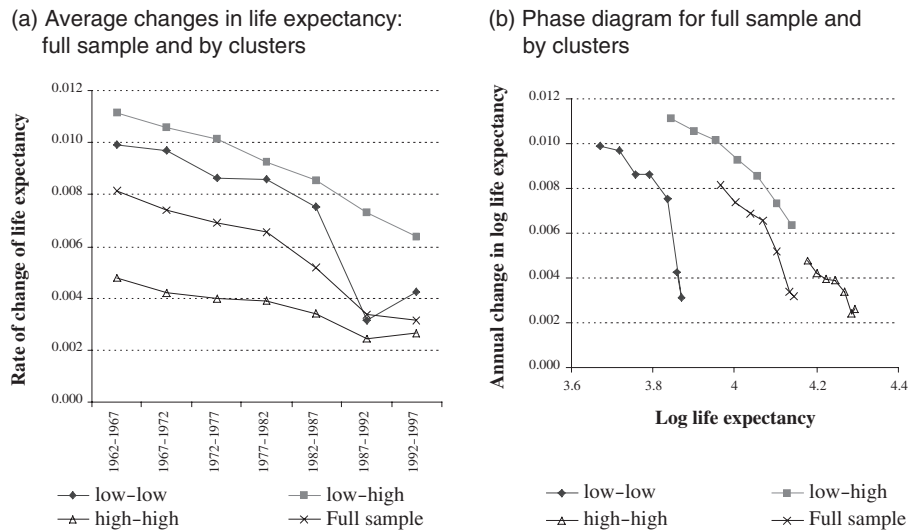


Figure 5.5 Life expectancy dynamics, 1962–1997

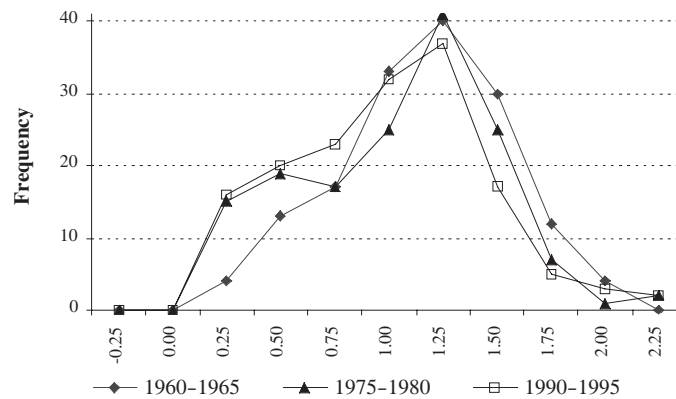


Figure 5.6 Histogram for quinquennial population growth rate for full sample

Another issue to be considered is whether the distribution of population growth may be behind the multi-peaked nature of the full sample. However, as can be seen in figure 5.6, the distribution of population growth was single-peaked in 1960. A growing number of countries experienced low population growths, but mostly in the HH group (figs. 5.7(a) and 5.7(b)). Figure 5.7(a) shows that the population growth histogram for the HH countries was twin-peaked, a piece of evidence for the existence of convergence clubs within this subsample. However, the distributions for the LL and LH countries are not very different, so they do not account for the difference between these groups. Nevertheless, the demographic transition was more advanced in the LH countries: they had a higher population growth in 1960 (which would imply slower economic growth!) and a lower one in 1997, confirming that these groups of countries were indeed on different development trajectories.

It is clear that life expectancy and the population growth rate were not direct determinants of the divergence between the LL and LH groups noted above. Suppose that these groups of countries are in different convergence clusters. According to the Howitt and Mayer-Foulkes (2002) model, the most likely determinant of membership would be the initial levels of capital and technology, because the human capital level, as indicated by life expectancy, is similar. Fixed factors such as institutional quality, productivity and incentives to innovate may affect membership, but countries similar in these respects may nevertheless belong to different convergence clubs for historical reasons. I show with a probit regression some correlates of whether a country belonged to the LH rather than the LL group. The probit regression, run on the LL and LH countries, is as follows (z -statistics in parentheses):¹³

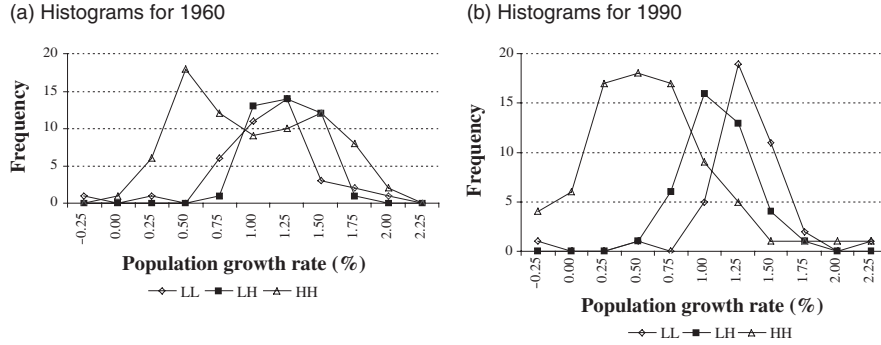


Figure 5.7 Population growth rate by cluster

$$\begin{aligned}
 I_{LH} = & -42.06 + 9.677\log(\text{LE1962}) + 1.608(\text{SECONDARY1960} > 5\%) + \\
 & (-2.648) \quad (2.386) \quad (2.637) \\
 & -0.010 \text{ URBAN1960} + 1.112 \log(\text{RGDP1960}) - 1.879 \text{ N1960} \\
 & (-0.376) \quad (1.817) \quad (-1.818)
 \end{aligned}$$

The significant indicators (all at better than 7 per cent) of belonging to LH rather than LL all reflect levels of physical and human capital and technology, except for the population growth rate, which appears as well.¹⁴

3.3 One or several convergence clubs: Levels

I now test whether the life expectancy dynamics are better modelled by taking the three groups of countries as convergence clusters than by considering the full sample as the only club. I use a descriptive quadratic model in time to look at the paths followed by the trajectories. Since life expectancy within countries is persistent, its initial level has a long-term impact and its disturbances are positively serially correlated. Therefore I use a fixed effects model and an autoregressive error structure. Both features were confirmed to be significant. In the presence of convergence clusters, each cluster's trajectory is expected to have distinct levels and parameters across time. The single-cluster model is the following:

Model L1. Single-cluster (with and without fixed effects):

$$\log(\text{LE}_{i,t}) = c_1 + c_2 \text{TIME}_t + c_3 \text{TIME}_t^2 + u_{i,t}.$$

Index i runs through the sample of countries and t takes values from 1962 to 1997 in five-yearly increments. TIME_t is measured in quinquennia

from 1 to 7. The cluster structure is modelled by choosing different quadratic expressions for each cluster. The three-cluster model is the following:

Model L2. Three-cluster (with and without fixed effects):

$$\begin{aligned} \log(LE_{i,t}) = & c_1 + (a_{LL}LL + a_{LH}LH + a_{HH}HH)TIME_t \\ & + (b_{LL}LL + b_{LH}LH + b_{HH}HH)TIME_t^2 + u_{i,t}. \end{aligned}$$

LL , LH and HH are dummies for the groups of countries selected above. Since life expectancy changes are persistent, it is to be expected that the errors $u_{i,t}$ show a positive serial correlation. This is confirmed by the Durbin–Watson statistic when the panel is estimated without autoregressive errors. The autoregressive error structure used to estimate level models L1 and L2 (with and without fixed effects) is:

$$u_{i,t+5} = \rho u_{i,t} + \varepsilon_{i,t}.$$

The White heteroscedasticity correction is applied, because regressions of squared OLS residuals showed significant correlation with quadratic expressions of the independent variables. It yields the more conservative estimates.

The results are shown in table 5.2. In the fixed effects case, the coefficients for all terms containing $TIME_t$ ($TIME_t^2$) are significant and positive (negative) as expected, and they are only somewhat less significant without fixed effects. F -statistics yielding p values of zero show that the three-cluster model is significantly better than the single cluster model.¹⁵ Wald tests (table 5.3) show that the coefficients describing the LH group of countries under fixed effects are significantly different from those describing the LL or HH groups, showing that the trajectories in this group are significantly different even after country fixed effects are taken into account. The Durbin–Watson test shows that no further significant autocorrelation exists in the AR(1) models.

3.4 One or several convergence clubs: Relative convergence

I estimate the following relative convergence models, each based on equation (5.11). It is worth noting that, since a *descriptive* feature is under examination, the problem of endogeneity does not arise. On the other hand, heterogeneity in the form of clusters is precisely what is being tested. Note that, in the presence of convergence clusters, differences in the convergence coefficients may be expected, but need not occur.

Table 5.2 Level models for life expectancy dynamics

	Model			
	L1	L1	L2	L2
	Single-cluster	(fixed effects) Single-cluster	Three-cluster	(fixed effects) Three-cluster
<i>C</i>	-12.13483 (-1.38)			
<i>TIME</i>	0.77488 (2.34)	0.09144 (4.22)		
<i>TIME</i> ²	-0.01597 (-2.82)	-0.00472 (-4.27)		
<i>LL</i>			1.10571 (0.56)	
<i>LH</i>			2.00817 (1.59)	
<i>HH</i>			3.38927 (6.44)	
<i>LL*TIME</i>			0.32514 (1.67)	0.11221 (3.04)
<i>LH*TIME</i>			0.25449 (2.34)	0.09933 (5.03)
<i>HH*TIME</i>			0.10905 (2.4)	0.04423 (5.41)
<i>LL*TIME</i> ²			-0.01343 (-1.82)	-0.00702 (-2.76)
<i>LH*TIME</i> ²			-0.00939 (-2.62)	-0.00453 (-3.79)
<i>HH*TIME</i> ²			-0.00417 (-2.81)	-0.00222 (-4.73)
AR(1)	0.95505 (140.28)	0.77265 (13.68)	0.89335 (43.18)	0.69453 (8.46)
<i>R</i> ²	.977	.983	.98	.984
Adjusted <i>R</i> ²	.977	.98	.98	.981
Durbin-Watson	1.84	2.16	2.01	2.1
<i>F</i> -statistic	15685	339	6015	344
Probability	0	0	0	0

Source: Author's compilation.

Note: Coefficients shown with *t*-statistics in parentheses.

Model RC1. Single-cluster (with and without country fixed effects):

$$(1/5)(\log(LE_{i,t+5}) - \log(LE_{i,t})) = c_1 + \beta \log(LE_t) + z_t + u_{i,t}.$$

Model RC2. Three-cluster:

$$(1/5)(\log(LE_{i,t+5}) - \log(LE_{i,t})) = (a_{LL}LL + a_{LH}LH + a_{HH}HH) + \beta \log(LE_t) + z_t + u_{i,t}.$$

Table 5.3 Wald tests of equality for set of cluster coefficients in level models

	Three-cluster model	
	L2	L2 (fixed effects)
LL = LH	9.01 (0)	9.3 (0.0001)
LH = HH	1.49 (0.2152)	33.45 (0)
LL = HH	6.3 (0.0003)	1.83 (0.1602)

Source: Author's compilation.

Note: Wald tests show F -statistic with probability in parentheses.

Model RC3. Full three-cluster (with and without country fixed effects):

$$\begin{aligned}
 (1/5)(\log(LE_{i,t+5}) - \log(LE_{i,t})) = & (a_{LL}LL + a_{LH}LH + a_{HH}HH) \\
 & + (b_{LL}LL + b_{LH}LH + b_{HH}HH)TIME_t \\
 & + (\beta_{LL}LL + \beta_{LH}LH + \beta_{HH}HH)\log(LE_t) \\
 & + z_t + u_{i,t}.
 \end{aligned}$$

Each of these models for equation (5.11) is estimated with fixed time effects z_t . When fixed effects are used they stand for the country-specific steady-state levels \underline{y}^* , together with φg . Model RC1 is a single-cluster model with convergence coefficient β . Model RC2 tests for different steady-state levels, assuming that the time-specific steady-state growth rates and convergence coefficient β are common. Model RC3 is a full three-cluster model with cluster-specific steady-state levels, growth rates and convergence coefficients (allowing for common time-specific effects). Again, this is particularly interesting in the case of fixed effects, for then it tests for cluster-specific properties *after* country-specific effects have been taken into account. The White heteroscedasticity correction was again necessary, and also yielded the most conservative estimates.

The coefficients for these models are reported in table 5.4. The convergence coefficients are significant and have the expected sign in all of the models. The full three-cluster model implies convergence is fastest in the LL group, next fastest in the larger HH group and slower in the LH group. This can be expected because the transition in LH may occur over different periods for different countries. The time coefficients have the correct sign and are quite significant after fixed effects have been taken into account. According to the Durbin–Watson statistics there is no

Table 5.4 Relative convergence models for life expectancy dynamics

	Model				
	RC1	RC1 (fixed effects)	RC2	RC3	RC3 (fixed effects)
	Single- cluster	Single- cluster	Three- cluster	Full three- cluster	Full three- cluster
<i>C</i>	0.043 (8.04)				
<i>LOG(LE)</i>	-0.00894 (-6.65)	-0.04447 (-4.01)	-0.02078 (-5.7)		
<i>LL</i>			0.08426 (6.21)	0.11238 (3.39)	
<i>LH</i>			0.09223 (6.49)	0.04177 (4.55)	
<i>HH</i>			0.09167 (6.07)	0.10901 (12.35)	
<i>LL*TIME</i>				0.00008 (0.15)	0.00173 (1.61)
<i>LH*TIME</i>				-0.00001 (-0.02)	0.00171 (2.47)
<i>HH*TIME</i>				0.0006 (1.48)	0.00128 (2.92)
<i>LL*LOG(LE)</i>				-0.028 (-3.09)	-0.07012 (-2.66)
<i>LH*LOG(LE)</i>				-0.00788 (-3.25)	-0.03805 (-3.71)
<i>HH*LOG(LE)</i>				-0.02517 (-11.93)	-0.04792 (-10.02)
<i>R</i> ²	.156	.39	.259	.278	.414
Adjusted <i>R</i> ²	.151	.283	.253	.27	.309
Durbin-Watson	1.81	2.14	1.95	1.95	2.03
<i>F</i> -statistic	29.8	3.6	43.6	33.2	3.9
Probability	0	0	0	0	0

Source: Author's compilation.

Note: Coefficients shown with *t*-statistics in parentheses.

significant autocorrelation of the errors along time. Hence the fact that the model is a first-order system is not a significant limitation, a question that the persistence of health and health improvements could pose.

In the case of the three-cluster model, the Wald tests in table 5.5 show that the LH convergence coefficient is significantly different from both its LL and HH counterparts in every case. All of the clusters are significantly different in the full three-cluster model without fixed effects, but

Table 5.5 Wald tests of equality for set of cluster coefficients for relative convergence models

	Three-cluster model		
	RC2	RC3	RC3 (fixed effects)
LL = LH	74.5 (0)	21.1 (0)	6.2 (0.0022)
LL = HH	0.4 (0.5387)	12.9 (0)	13.1 (0)
LH = HH	20.1 (0)	24.2 (0)	0.9 (0.41)

Source: Author's compilation.

Note: Wald tests show F -statistic with probability in parentheses.

LH and HH cannot be distinguished once fixed effects are taken into account, which is consistent with the idea that the LH cluster is a group of countries in transition towards the same club that HH is in. The fixed time effects z_t were jointly significant in every case.

F -tests comparing the single-cluster models with the three-cluster models find that the inclusion of cluster-specific coefficients is highly significant in every case, both with and without fixed effects (see table 5.6 for the F -tests). This is strong evidence that switching to the three-cluster specification is a significant improvement over the single-cluster specification, whether country-specific effects are taken into account or not.

The finding that life expectancy dynamics are cluster specific is very robust. Both in the regressions shown here and in many other estimates performed during the course of this study (with and without the White correction or the AR(1) terms and using other functional forms), the

Table 5.6 F -tests for model extensions

To	From		
	Single-cluster	Three-cluster	Single-cluster (fixed effects)
Three-cluster	64.3 (0)		
Full three-cluster	107.7 (0)	31.8 (0)	
Full three-cluster (fixed effects)			30.4 (0)

Source: Author's compilation.

Note: F -statistic, probability in parentheses.

F-tests consistently show the three-cluster model to be significantly better, and the Wald tests consistently show that the cluster-specific sets of coefficients differ significantly. The multiple-peak structure is also explained only by the three-cluster models.

4 Conclusions

Econometric tests show that both the levels and the relative convergence of life expectancy trajectories are better described as cluster-specific than as single-cluster phenomena, both when country-specific effects are taken into account and when they are not. The statistical analysis thus confirms what is evident to the eye in the sequence of histograms (fig. 5.1) and in the location of mean life expectancy by cluster (fig. 5.2). A single-cluster description of levels or of convergence properties of life expectancy dynamics proves to be misspecified, and a study of the averages yields little insight into the processes occurring within each cluster. Moreover, such a description cannot explain the multiple-peaked nature of the data. As I discussed above, there is no evident exogenous reason, including population growth rates, for multiple-peakedness. The three subsamples that were defined each follow quite different trajectories yet enjoy the property of relative convergence, with parameters differing between them. The tests that were conducted provide strong evidence that large-scale life expectancy and therefore economic growth convergence clubs exist. It is clear that the methods used cannot yield a firm categorization of countries or detect the underlying economic causes. Indeed, it is quite possible that a further subdivision of the clusters would conform more closely with reality. The HH group in particular may contain further clustering, a subdivision that is not attempted here.

The characteristics of the three groups of countries can be roughly mapped into the convergence club typology of the Howitt and Mayer-Foulkes (2002) model as follows. The life expectancy of the LL countries is consistent with slow-growing, stagnant economies whose technological change consists of implementation that requires very little and almost costless innovation. The life expectancy improvement of LH countries, on the other hand, requires achieving the implementation of a series of technologies. This cluster may thus consist of countries transiting from the stagnating to the implementation convergence clubs. The HH group contains those countries carrying out R&D, but also contains many countries that only implement technology. It is shown in further work using income data that the HH group can be subdivided into three clusters of countries that roughly correspond to the implementation and R&D clubs and to rapidly growing countries transiting between them (Mayer-Foulkes, 2002). The club structure in life expectancy dynamics

may also have causes rooted in health-specific poverty traps. Examples would be a low-income trap explained by efficiency wages, or by persistent educational inequality as in Galor and Mayer-Foulkes (2002). In any case, the divergence between the LH and LL countries constitutes strong evidence for a human development barrier to growth occurring at low-income levels.

It is much harder to detect convergence clubs in the income data. In this sense the life expectancy data are special in that the club structure is much more evident and can be detected with simpler econometric methods. Life expectancy has an inescapable technological dimension and may provide a better indication of basic technological development than income, which can result from highly specialized production and which may therefore give only a poor reflection of the general state of technology.

I have shown that life expectancy can be modelled in terms of the underlying economic variables (capital and technology). The dynamics of these variables are in turn described by theories of economic growth. Generically, any steady state in any model will give rise to the steady-state-specific convergence equation that I have tested. Thus the descriptive properties of life expectancy dynamics provide a qualitative test of economic growth theories, giving strong evidence that only theories implying convergence clubs are valid.¹⁶ Such theories can explain the nature of the economic processes that give rise to multiple steady states and convergence clubs, and lead to an understanding of states of development. Examples of such explanation could be the type of technological innovation taking place or health-related poverty traps.

The existence of convergence clubs implies that countries may remain trapped in their state of underdevelopment if market policies only are followed. This holds even more strongly for convergence clubs in health, an indicator of the human development that is essential for productivity growth. Perhaps this is one reason market policies for globalization and growth have not been as effective as hoped for, specifically in the case of the least developed countries. Only the recognition and careful study of multiple steady states and convergence club dynamics can lead to policies that can succeed in overcoming poverty traps and changing states of development.

Notes

1. Quah's study finds twin peaks in the life expectancy distribution since 1962, implying that a pre-existing convergence club structure may be the antecedent for the divergence in incomes found by Quah. The changing twin-peaked structure found here is more specific than, but not inconsistent with, the "emerging twin peaks".

2. Only 24.4 per cent of the countries that will be classified below as having low life expectancy in 1962 were classified by the 1990s as diversified exporters in the World Bank database referred to in note 3.
3. The address is www.worldbank.org/research/growth/GDNdata.htm.
4. By comparison, the 1960–1995 GNP panel is complete for only 122 countries. Even fewer educational data are available.
5. The histogram does not weight countries by population, because doing this would reflect mostly the development of India and China.
6. This assumption is necessary to obtain convergence equation (5.11).
7. I follow the first version of the Howitt and Mayer-Foulkes model, because it is closer to the Solow model. This version can be found at http://www.cide.edu/investigadores/David_M/HomePage.htm. In any case the essential point here is arriving at equation (5.7) below for life expectancy, and this can be done for the later version of the paper as well (Howitt and Mayer-Foulkes, 2002).
8. Visual examination, as well as subdivision of the intervals, confirms that these features are robust to the choice of life expectancy intervals.
9. The means and their confidence intervals are estimated by regressing against a constant for each time-period.
10. The histograms in figure 5.1 portray a balanced sample of 159 countries. For the regressions I was slightly less stringent and included all countries for which data were available in 1962 and 1997. This added four countries that were missing a single data point (subsample and year in parentheses): China (LH, 1977), Hungary (HH, 1977), Japan (HH, 1977) and Turkmenistan (HH, 1992). The full subsamples are the following:
Low–Low: Afghanistan, Angola, Benin, Botswana, Burkina Faso, Burundi, Cambodia, Central African Republic, Chad, Dem. Rep. Congo, Rep. Congo, Côte d'Ivoire, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Guinea, Guinea-Bissau, Haiti, Kenya, Lao PDR, Liberia, Malawi, Mali, Mauritania, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Somalia, Tanzania, Togo, Uganda, Rep. Yemen, Zambia and Zimbabwe.
Low–High: Algeria, Bangladesh, Bolivia, Cameroon, Cape Verde, China, Comoros, Dominican Republic, Ecuador, Arab Rep. Egypt, El Salvador, Ghana, Guatemala, Honduras, India, Indonesia, Iran, Iraq, Lesotho, Libya, Madagascar, Maldives, Mongolia, Morocco, Myanmar, Namibia, Nepal, Nicaragua, Oman, Pakistan, Papua New Guinea, Peru, Philippines, Saudi Arabia, South Africa, Sudan, Swaziland, Syrian Arab Republic, Thailand, Tunisia, Turkey and Vietnam.
High–High: Albania, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belarus, Belgium, Brazil, Bosnia and Herzegovina, Brunei, Bulgaria, Canada, Chile, Colombia, Costa Rica, Cuba, Cyprus, Denmark, Estonia, Fiji, Finland, France, Germany, Greece, Guadeloupe, Guyana, Hong Kong, Hungary, Iceland, Ireland, Israel, Italy, Jamaica, Japan, Dem. Rep. Korea, Rep. Korea, Kuwait, Latvia, Lebanon, Lithuania, Luxembourg, Macao, Malaysia, Malta, Martinique, Mauritius, Mexico, the Netherlands, Netherlands Antilles, New Caledonia, New Zealand, Norway, Panama, Paraguay, Poland, Portugal, Puerto Rico, Qatar, Reunion, Romania, Singapore, Slovenia, Spain, Sri Lanka, Suriname, Sweden, Switzerland, Taiwan, Tajikistan, Trinidad and Tobago, Turkmenistan, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Venezuela and Yugoslavia (Serbia/Montenegro).
11. See also the level regressions and figure 5.2.
12. Figure 5.5(b) is in logarithms so as to correspond with the convergence estimates.
13. I_{LH} is an indicator function equal to 1 for LH and 0 for LL countries. LE1962, SECONDARY1960, URBAN1960, RGDP1960 and N1960 are life expectancy, the proportion of secondary school enrolment and urban population, real GDP, and

five-yearly average percentage population growth in the corresponding years, obtained from the World Bank database. A dummy is created from SECONDARY1960, as indicated.

14. The differences between the means in the LH and LL samples multiplied by their coefficients yield magnitudes that put these indicators of membership in LH in order (mean difference times coefficient in parentheses): LE1962 (4.335), RGDP1960 (1.001), SECONDARY1960 (0.622) and N1960 (−0.287). Urbanization, a correlate of development, may have an ambiguous impact because of its adverse effects on health.
15. To conduct these tests, LL was substituted with 1 in each model. The hypothesis that the coefficients of the variables containing LH and HH are all zero was then tested.
16. This is not meant to exclude models with prolonged transitions such as Kremer, Onatski and Stock (2001), which can be analysed analogously.

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Reaching the poor: Fine-tuning poverty targeting using a poverty map of Mozambique

Orlando San Martin

1 Introduction

Poverty alleviation is a very important aspect of the national economic and social policy mix in many developing countries. Poverty alleviation programmes tied with growth enhancement policies are a high priority in national policy design in countries suffering from increasing population pressures and deteriorating living and economic conditions. Likewise, even in countries that have managed to achieve considerable levels of economic growth, special efforts to combat poverty are required, because considerable portions of their populations still live in poverty.

My case of interest, Mozambique, belongs to this category of countries. Having achieved outstanding levels of economic growth during the late 1990s, Mozambique is still experiencing relatively high poverty rates. It is not only the high rates of poverty that are frustrating, but also the significant levels of inequality in the regional or geographical distribution of poverty. As recently as September 2002, President Chissano of Mozambique stressed that the government's top priorities remain "the struggle against absolute poverty, the reduction of regional imbalances, and rural development" (AIM, 2001a).

One major concern in the efforts to combat poverty is related to identifying the poor. It is difficult, time consuming and costly to measure poverty on a nationwide scale. Typical living standard measurement surveys (LSMS) take more than two years to produce results and require a

minimum budget of US\$500,000 and sometimes over US\$1 million (Scott, 1998). In addition, nationwide surveys on living conditions are based on sample designs that allow poverty levels to be identified only for major regions or administrative divisions. Thus, they are usually not good enough to guide poverty alleviation efforts aimed at attacking poverty at local levels.

Geographical targeting has been widely recognized as a possible solution to the problem of identifying and reaching the poor. It is administratively easier and cheaper to direct poverty alleviation efforts to the localities where the poor live. However, the smaller the geographical unit chosen, the greater is the likelihood of a successful allocation of effort. Therefore, estimated provincial poverty rates or poverty rates disaggregated only for urban and rural areas are still inadequate for such purposes. Instead, "poverty maps", which provide a disaggregated picture of living conditions, can be used to identify the poor and to focus poverty alleviation efforts (Elbers, Lanjouw and Lanjouw, 2000; Henninger, 1998; Hentschel et al., 1998; Minot, 2000).

I claim in this chapter that, even though important efforts have been made by the national statistics office (Instituto Nacional de Estadísticas, INE) to gather key information, relatively few studies make use of these data and apply them to orient the decisions of policy makers. I intend to illustrate how some of these sources of data may be employed in the fight against poverty, assessing the strengths and weaknesses of different targeting indicators.

The chapter is organized as follows. In the second section, I briefly discuss the relevance of geographical targeting for poverty alleviation in Mozambique. Section 3 presents the data sources used in my empirical exercises as well as descriptive statistics on general living conditions. Section 4 presents an econometric model to estimate and predict disaggregated poverty measures. Section 5 discusses and compares the performance of different geographical targeting schemes. I conclude with some final remarks in section 6.

2 Poverty alleviation in Mozambique

Mozambique is a developing country with one of the lowest average incomes per capita in the world (World Bank, 2001).¹ Since the early 1990s, with the achievement of the peace agreements and the end of a prolonged war, the Government of Mozambique has made important efforts to improve the living conditions of the majority of the population. As the result of dramatic transformations in the political and economic system, the economy grew during the late 1990s at rates close to 10 per

cent per year. However, poverty rates as measured in 1997 are still very high (close to 70 per cent).

The government has been very active in the promotion of plans and actions to reduce poverty. It recently issued an action plan to reduce absolute poverty, known as PARPA (from its Portuguese name, *Plano de Acção para a Redução da Pobreza Absoluta*) confirming its strong commitment to attacking poverty.² The PARPA 2001–2005 presents the government's strategic vision for reducing poverty, its main objectives and the key actions to be pursued. The PARPA 2001–2005 is also Mozambique's first Poverty Reduction Strategy Paper (PRSP). The stated objective of the new PARPA is to improve the capacities of, and the opportunities available to, all Mozambicans, especially the poor. The quantitative targets in the PARPA aim to reduce the incidence of absolute poverty from 70 per cent in 1997 to less than 60 per cent by 2005 and to less than 50 per cent by the end of the decade.

In particular, there are two issues mentioned in the PARPA that I consider to be of interest and which my chapter attempts to deal with. The first issue has to do with concern about the notable urban–rural and regional imbalances in terms of the economic opportunities and living conditions of the population. The document recognizes the need to search for a better regional balance, with special attention given to regions with the greatest concentration of poor people. In line with this, in January 2001 the government for the first time released the national state budget broken down to province level. Making the geographical allocation of state resources explicit is an important step in reducing the imbalances. However, the actual budget allocation was criticized for the resulting inequalities in the per capita shares of the provinces (AIM, 2001b).

The second issue is the important step taken in the conceptual framework of the PARPA of recognizing the multidimensional character of poverty by going beyond a strictly income- or monetary-based conception of poverty. Related to this issue, the PARPA recognizes that, in addition to poverty, many Mozambicans also suffer from vulnerability to natural disasters and economic shocks. Following this conceptual framework, the PARPA poverty reduction strategy is based on six priorities, aiming at promoting human development and at creating a favourable environment for rapid, inclusive and broad-based growth. The main areas of action proposed by the PARPA are education; health; agriculture and rural development; basic infrastructure; good governance; and macroeconomic and financial management.

In this chapter, I provide tools to improve the effectiveness of poverty alleviation activities that complement the government's efforts and are easily available. In line with the concerns expressed in the PARPA, these tools aim to illustrate the heterogeneity in living conditions of the

population in a disaggregated manner. In addition, I avoid focusing only on income/expenditure-based indicators and suggest instead a multi-dimensional indicator of living conditions, which covers some of the areas of concern included in the six priority areas.

3 Assessing poverty and living standards in Mozambique

3.1 Data sources

Mozambique is administratively divided into 10 provinces plus the capital city of Maputo, 146 districts and 426 *postos administrativos* (INE, 1999).³ The current nationwide poverty measures available for Mozambique are representative only at the provincial level, and do not provide a complete picture of the intra-provincial variation in living conditions. Populations of the districts and *postos administrativos* also vary widely. Whereas the mean population of districts is 104,646, for *postos* it is 35,784. The populations of districts range from 7,063 to 424,662, whereas *postos* have between 439 and 227,869 inhabitants.

In this chapter I combine two main data sources in order to construct a disaggregated poverty map: (a) a standard of living survey (following the LSMS pattern of household surveys) undertaken in 1996–1997 by the finance ministry with the support of the International Food Policy Research Institute (IFPRI), which covered a province-wide representative sample of some 8,000 households in all 10 provinces; and (b) the most recent national population and housing census, covering the entire population.

The household survey – the *Inquérito Nacional aos Agregados Familiares sobre as Condições de Vida* (MIAF) – was carried out between February 1996 and March 1997 by the INE and closely follows the typical living standards measurement surveys of the World Bank. The MIAF dataset has been used extensively for poverty assessments in Mozambique.⁴ The MIAF sample covers 8,274 households and is nationally representative. Household information was collected in urban and rural areas in all 10 provinces and in the capital city of Maputo. The sample in each province was collected by selecting a cluster of households in almost every district. The representativeness of this living standards survey is limited to country, provincial or (urban/rural) area levels. For lower levels of disaggregation, the MIAF sample does not produce results that are representative of the population.

The second source of information used in this chapter is the national population and housing census of 1997, which was carried out just a few months after the completion of the MIAF. The national population

census, covering the total population, provides detailed demographic information about households. The census also includes a section on housing conditions, providing information on the main characteristics of the house, access to public services and possession of some basic assets. I had access to census data at a fairly low level of disaggregation,⁵ the *postos administrativos*, to conduct the analysis presented in this chapter.

Table 6.1 lists the variables that appear to be relevant for poverty analysis. The variables included in my two main data sources are the most attractive ones for the econometric exercise in the next section.

Table 6.1 Poverty descriptors in the household survey and national census for Mozambique

Description	MIAF97	Census
<i>Economics</i>		
Consumption expenditures	✓	n.a.
<i>Demographics</i>		
Household size	✓	✓
Number of persons age >14 years	✓	✓
Sex of household head	✓	✓
Ethnic origin of household head	✓	✓
Locally born household head	Province level only	✓
Number of locally born age >14 years	✓	✓
Dependency ratio	✓	✓
Household head age	✓	✓
Household age (average)	✓	✓
Households with young mother (<17 years)	✓	✓
<i>Human capital/Education</i>		
Head of household literate (read/write)	✓	✓
Head of household speaks Portuguese	✓	✓
Highest education level: head of household	✓	✓
Highest education level: head and couple	✓	✓
Literacy ratio: literate adults/total adults	✓	✓
Schooling enrolment	✓	✓
<i>Assets and housing conditions</i>		
Housing density: no. of persons/no. of bedrooms	✓	✓
Use of electricity	✓	✓
Quality/material of house floor	✓	✓
Quality/material of house roofs	✓	✓
Sanitation type	✓	✓
Quality/material of house walls	✓	✓
Source of drinking water	✓	✓
Radio ownership	✓	✓
Provincial dummies	✓	✓

Sources: INE (1998, 1999).

3.2 Expenditure-based poverty measures

By using the household-level MIAF dataset, it is possible to calculate different expenditure-based poverty or well-being measures. Here, I use the Foster–Greer–Thorbecke (FGT) family of poverty measures for my expenditure-based poverty estimates (Foster, Greer and Thorbecke, 1984).⁶ The most widely used FGT poverty measures are generated by the cases $\alpha = 0, 1$ and 2. In this chapter, I use only the first two cases. When $\alpha = 0$, P_0 corresponds to the headcount ratio, i.e. the proportion of the population below the poverty line. When $\alpha = 1$, P_1 corresponds to the poverty gap, which can be interpreted as a per capita measure of the total shortfall divided by the population size and expressed as a ratio of the poverty line (Deaton, 1997).

In table 6.2, I present the headcount ratios (P_0) and the poverty gaps (P_1) by province for urban and rural areas in Mozambique. Comparing the figures for P_0 and P_1 for urban and rural areas separately shows that they follow each other very closely. However, comparing the rankings of urban poverty measures with those of rural poverty reveals a much more heterogeneous pattern.

In large administrative units, such as provinces, there is plenty of room for internal variation. Given the size and distribution of the survey sample, the MIAF cannot capture intra-provincial variations. In sections 4 and 5 I suggest alternative indicators to capture the intra-provincial variations in living conditions of the population.

Table 6.2 Poverty measures by province and area of residence

Province	Rural areas				Urban areas			
	P_0	Rank	P_1	Rank	P_0	Rank	P_1	Rank
Niassa	0.72	5	30.6	5	0.67	6	28.1	5
Cabo Delgado	0.57	10	19.1	10	0.67	5	28.7	4
Nampula	0.65	7	24.6	8	0.83	1	44.4	1
Zambezia	0.69	6	26.1	6	0.60	8	24.9	6
Tete	0.84	3	39.5	3	0.74	2	35.2	2
Manica	0.64	9	24.7	7	0.58	9	21.4	9
Sofala	0.92	1	54.1	1	0.71	3	30.8	3
Inhambane	0.87	2	41.4	2	0.62	7	24.1	7
Gaza	0.64	8	23.0	9	0.69	4	22.8	8
Maputo Province	0.77	4	32.8	4	0.48	10	20.0	10
Maputo City	–	–	–	–	0.48	11	16.5	11

Source: INE (1998).

Note: P_0 is the headcount ratio; P_1 is the poverty gap.

3.3 Poverty assessment and “basic needs” indicators

It is possible to identify, at the most simplistic level, two extreme approaches to the definition and measurement of poverty. One extreme is the “conventional” approach, where income or consumption measures are used to proxy poverty. The other is a “participatory” approach, where multiple – and sometimes more subjective – elements define poverty and well-being (Moser, 1998). Nevertheless, there is today a growing consensus among economists regarding the advantages and shortcomings of monetary-based (income or expenditure) and non-monetary-based poverty measures.⁷

It is usually very difficult to find reliable and up-to-date data to assess income- or expenditure-based poverty on a nationwide basis in developing countries. These assessments often require a rather detailed and systematically collected set of information on household income/expenditure patterns. The process of gathering, processing and analysing this type of information is usually time consuming and expensive, especially when one is interested in a nationwide representative sample. Monetary-based indicators, however, are easier to quantify and are better suited for comparisons across countries or regions. Nevertheless, they fall short in representing a whole range of important aspects of people’s livelihoods.

Poverty and well-being can also be proxied with other welfare indicators. A series of basic needs, human poverty and vulnerability indicators have been developed and widely used in poverty assessments. These indicators of well-being are often constructed in an ad hoc manner depending on the purpose of the assessment and on the type of available data.

In Mozambique, we find appraisals of both monetary- and non-monetary-based poverty indicators. For example, the traditional approach is well represented by the report *Understanding Poverty* (MPF, 1998), which uses the MIAF dataset. Meanwhile, the participatory approach can be illustrated by a series of participatory diagnoses of poverty, also organized by the Ministry of Planning and Finance in collaboration with the Universidade Eduardo Mondlane, and carried out during January 2001 in 21 districts in 7 provinces (Cabo Delgado, Nampula, Zambezia, Sofala, Tete, Inhambane and Maputo Province).⁸

Non-monetary-based poverty indicators usually build on data similar to the sort given in table 6.3; this table presents a set of variables capturing dimensions of the population’s well-being over and above the income/expenditure-based poverty measures. These variables are divided into three main categories: demographic, human capital and assets condition. I use most of these variables in my econometric estimates in the next section.⁹

Table 6.3 Summary socioeconomic indicators

Indicator	Country	Urban	Rural
<i>Demographic</i>			
Household size ^a	4.20	4.75	4.01
Persons >14 years old ^c	55.54	56.98	54.94
Female household head ^b	30.46	28.61	31.10
Minority household head ^b	16.41	24.71	13.53
Local head (never left location) ^b	76.73	60.92	82.20
Locals >14 years old ^d	76.98	65.31	81.95
Dependency ratio ^a	47.41	44.70	48.35
Household head age ^a	40.52	39.72	40.80
Household age ^a	24.93	24.02	25.25
Young mother (<17 years old) ^b	1.21	0.96	1.36
<i>Human capital</i>			
Literate household head ^b	38.47	65.58	29.08
Household head speaks Portuguese ^b	42.76	74.15	31.88
Household head with education above basic ^b	11.78	30.12	5.43
Head and spouse with education above basic ^b	2.68	8.97	0.50
Literacy ratio ^a	32.20	59.93	22.59
Schooling attendance rate ^a	40.55	60.99	31.16
<i>Assets condition</i>			
Housing density ^a	3.17	3.57	3.21
Electricity ^b	5.21	18.17	0.73
Poor-quality floors ^b	85.71	57.41	95.43
Poor-quality roofs ^b	82.56	51.11	93.38
Poor-quality sanitation ^b	96.62	89.31	99.06
Poor-quality walls ^b	88.58	67.52	95.79
Low-quality drinking water ^b	91.17	70.09	98.39
Radio ownership ^b	28.27	49.06	21.06
Male population (per cent)	47.92	49.34	47.33
Female population (per cent)	52.08	50.66	52.67
Total population	15,278,324	4,447,160	10,831,164
Total number of households	3,634,315	935,440	2,698,875

Source: INE (1999).

Notes:

a. Average.

b. As percentage of households.

c. As percentage of population.

d. As percentage of population >14 years.

4 Disaggregating poverty measures

Although policy makers and analysts express concern about regional imbalances in living conditions, there are no expenditure-based poverty measures in Mozambique for geographical/administrative levels below

the provincial level. Thus, we need to estimate a model that allows us to predict well-being measures at lower levels of disaggregation; with this objective in mind, I follow a two-step procedure.

4.1 Estimation strategy

As a first step, I estimate a maximum likelihood probit model of poverty measures at the household level. For this estimation, I use MIAF data on demographics, human capital and the ownership of assets by households. Not least important for my exercise, the MIAF also provides a detailed description of household consumption expenditure. The household consumption expenditure used to measure poverty is an aggregate measure, which includes not only actual expenditures but also self-consumption of food and non-food items, imputed values for owner-occupied houses and household durable goods. The figures for per capita consumption expenditure and the poverty line used to assess the incidence of poverty were adjusted for temporal and spatial differences.¹⁰ With this information, I am able to classify the households into poor and non-poor categories.

One finds two main approaches to poverty mapping in the literature. One approach relies on the availability of detailed information, usually unit record files from national censuses, in addition to household-level income/expenditure information from nationwide surveys. The advantage of this approach is that it allows estimation of several poverty indicators, for example headcount rates and poverty gaps. In addition, standard errors can be constructed for the estimated indicators. This is the approach followed in several poverty studies for Ecuador (Hentschel et al., 1998; Elbers, Lanjouw and Lanjouw, 2000). However, access to unit record census data is the exception rather than the rule. For that reason, the second approach to poverty mapping avoids the use of unit record data and proceeds instead to estimate probit models of poverty. This method lacks the statistical precision of the former, but has the advantage that it can be applied in cases where the analyst has access only to published census information. This approach was used in poverty studies for Viet Nam (Minot, 2000) and Peru (Schady, 2000) and is the one adopted in this chapter.

I estimate two econometric models for urban and rural areas, respectively, to assess the probability that a household is poor, i.e. that the per capita aggregate consumption is below the poverty line.¹¹ The set of explanatory variables used to estimate the probability of being poor is divided into four major categories: demographic characteristics, human capital/education status, asset condition and provincial dummies. I am aware that some of the explanatory variables in my model are problematic. The variables related to household ownership of assets may be

endogenous, in part determined by household expenditures. This is a common problem in poverty regressions (Minot, 2000). One may also argue that some of the variables related to human capital formation or the education of household members are not a determinant of poverty, but rather the outcome. Maintaining these variables in my model is justified because I am not modelling the “determinants” of poverty; rather I am interested in identifying the poor.

I use a slightly different set of explanatory variables for the urban and rural poverty models. In the urban poverty model I include variables related to services (electricity, sanitation) or the quality of housing materials (floors) that may capture the difference between poor and non-poor households. For the rural poverty model I include provincial dummy variables to capture any other difference not properly accounted for in other variables included in the model.

Table 6.4 shows the coefficients and *t*-statistics for the models for urban and rural poverty.¹² Most of the coefficient signs in my model are as expected. In the urban model, households with an older head tend to be poorer, whereas households with higher average age tend to be less poor. Also in the urban sector, the probability that the household is poor is lower when the proportion of literate adults in the household is higher. The presence of electricity in the home is also strongly significant for the urban sector model. In the rural sector, a larger proportion of persons over 14 years makes it less likely the household is poor. Other variables that were significant for both models are household size, household head belonging to an ethnic minority, household head with education above the basic level, schooling attendance rate, housing density and ownership of a radio. Finally, the statistical significance of some of the provincial dummy variables indicates that, even after controlling for the variables included in my rural model, some provinces are poorer than Niassa province, the reference region.

4.2 Predicting poverty measures

The second step is an “out-of-sample” econometric prediction of the headcount ratios at the *posto administrativo* level. For this prediction, I use the *posto administrativo* median of the relevant independent variables included in the probit model and the coefficients obtained from the urban and rural sector models, respectively. Figures 6.1 and 6.2 show different versions of the poverty map for Mozambique.

The results of my econometric exercise allow me to construct a poverty map for rural areas disaggregated at the *posto administrativo* level. Figure 6.1 illustrates different ranges of predicted headcount ratios in a disaggregated manner. In contrast with the provincial-level poverty

Table 6.4 Maximum likelihood probit estimation results

Variable	Urban	Rural
Household size	0.0883 (3.547***)	0.552 (11.91***)
Household size squared	— (—)	−0.026 (−9.70***)
Population >14 years	−0.2456 (−0.558)	−0.583 (−2.12**)
Female household head	0.0381 (0.311)	−0.091 (−1.26)
Household head belongs to ethnic minority	−0.1708 (−1.739*)	−0.358 (−2.08**)
Household head local	— (—)	0.075 (0.54)
Interaction term: local & minority	−0.2351 (−1.291)	0.253 (1.27)
Proportion of local population >14 years	0.0881 (0.805)	−0.338 (−1.99**)
Dependency ratio	0.0013 (0.382)	0.0029 (1.63)
Household head age	0.0138 (2.533**)	−0.0032 (−1.05)
Average household age	−0.0349 (−3.861***)	0.0048 (0.84)
Household with young mother (<17 years)	0.4534 (1.369)	0.0012 (0.01)
Household head reads and writes	−0.0954 (−0.389)	−0.097 (−1.16)
Household head speaks Portuguese	0.0117 (0.07)	−0.048 (−0.70)
Household head with education above basic	−0.2444 (−1.806*)	−0.269 (−2.07**)
Household head and spouse with education above basic	— (—)	−0.417 (−1.03)
Literacy ratio in household (literate adults/ no. of adults)	−0.6891 (−3.714***)	−0.201 (−1.65)
Schooling attendance rate	−0.2602 (−2.33**)	−0.347 (−3.18***)
Housing density	0.0665 (2.76***)	0.052 (2.65***)
Household with electricity	−0.7196 (−5.857***)	—
Household with poor-quality floors	0.2567 (2.849***)	—
Household with poor-quality sanitation	0.3872 (2.49***)	—
Household with poor-quality drinking water	−0.0297 (−0.216)	—
Radio ownership	−0.3259 (−3.6***)	−0.403 (−6.79***)

Table 6.4 (cont.)

Variable	Urban	Rural
<i>Provincial dummies</i>		
Cabo Delgado	–	–0.346 (–1.69*)
Nampula	–	–0.182 (–0.89)
Zambezia	–	0.003 (0.02)
Tete	–	0.317 (1.49)
Manica	–	–0.481 (–2.15***)
Sofala	–	0.747 (3.57**)
Inhambane	–	0.491 (2.43**)
Gaza	–	–0.329 (–1.66**)
Maputo Province	–	0.062 (0.29)
Constant	0.3051 (0.708)	–0.845 (–2.85***)
No. of observations	2,385	5,722
No. of strata	11	10
No. of primary sampling units	77	196

Source: Author's compilation.

Notes: Dependent variable equals 1 if household is poor, 0 otherwise (*t*-statistics in parentheses). * significant at 10 per cent, ** significant at 5 per cent, *** significant at 1 per cent. All standard errors corrected for sample design effects.

measures (calculated from the MIAF dataset), the disaggregated map shows a wider range of variation in headcount ratios within the provinces. In section 5, I use these predicted ratios as one criterion for comparing the performance of geographical targeting with other targeting/allocation indicators. Table 6.5 shows the predicted headcount ratios for urban and rural areas and the provincial ranking for each indicator. A comparison of the predicted headcount ratios with actual ratios at the provincial level shows that the model, especially for rural areas, performs reasonably well. Even though the magnitude of the obtained rates may differ, the ranking of provinces by headcount ratios remains very much the same. In contrast, the model adopted for the urban sector is rather poor.

Figure 6.2 illustrates the deviations between the actual (provincial) rates calculated from the MIAF dataset and the predicted rates (at the

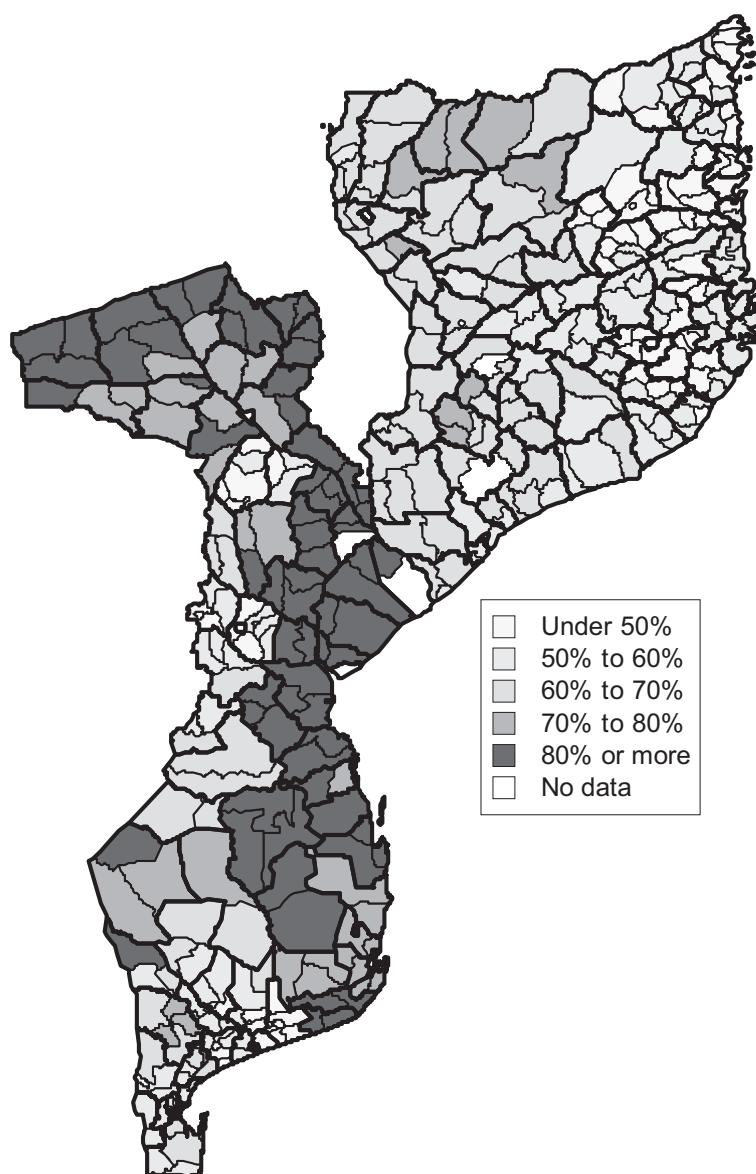


Figure 6.1 Predicted headcount ratios for rural areas, by *posto administrativo*

posto administrativo level) for rural areas obtained from my econometric estimation.¹³ The *postos administrativos* labelled as “worse cases” are those where the predicted headcount ratios are larger than the actual

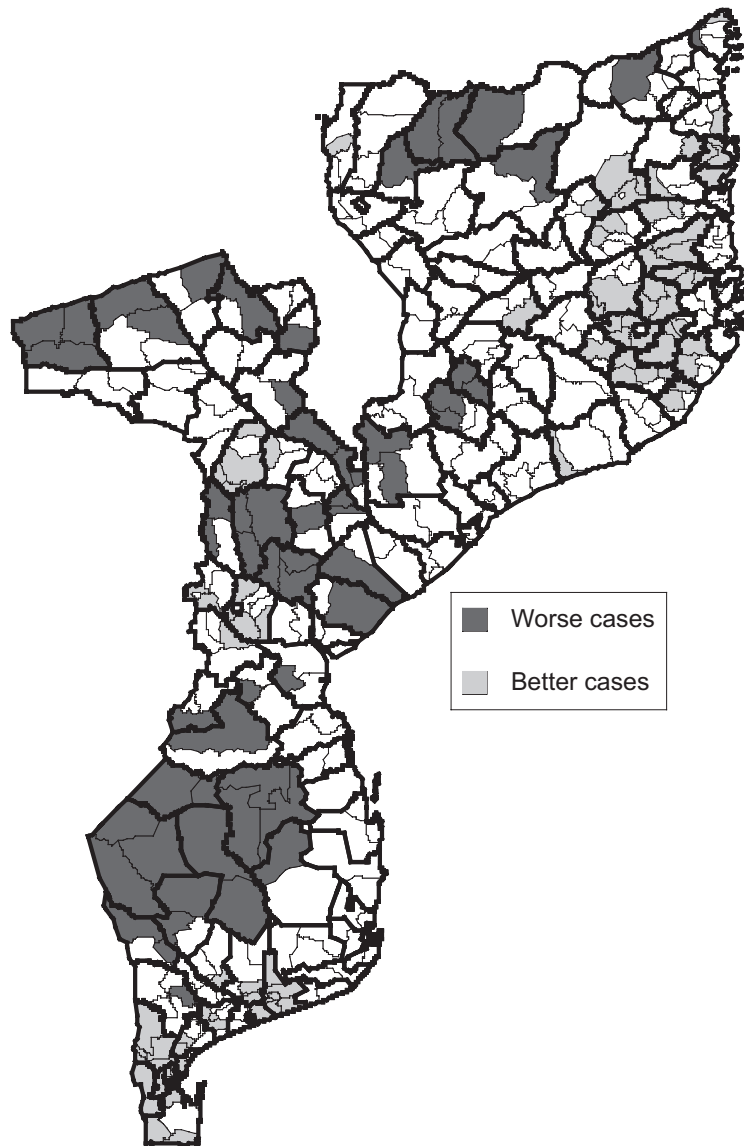


Figure 6.2 Comparing actual and predicted headcount ratios for rural areas

provincial headcount ratios obtained from the MIAF. This means that it is worth investigating in these *postos* whether the provincial poverty rates are representative of the actual living conditions of the population. These

Table 6.5 Comparing predicted and actual headcount ratios

Province	Rural areas				Urban areas			
	MIAF	Rank	Predicted	Rank	MIAF	Rank	Predicted	Rank
Niassa	0.72	5	0.65	4	0.67	6	0.45	2
Cabo Delgado	0.57	10	0.47	10	0.67	5	0.42	3
Nampula	0.65	7	0.53	8	0.83	1	0.42	5
Zambezia	0.69	6	0.63	5	0.60	8	0.46	1
Tete	0.84	3	0.82	2	0.74	2	0.39	9
Manica	0.64	9	0.55	7	0.58	9	0.40	6
Sofala	0.92	1	0.91	1	0.71	3	0.42	4
Inhambane	0.87	2	0.80	3	0.62	7	0.40	8
Gaza	0.64	8	0.53	9	0.69	4	0.40	7
Maputo Province	0.77	4	0.61	6	0.48	10	0.34	10
Maputo City	–	–	–	–	0.48	11	0.31	11

Sources: INE (1998, 1999) and author's calculations.

Note: Reported provincial predicted headcount ratios are population-weighted averages of predicted ratios at the *posto administrativo* level.

postos are candidates for having larger shares of their population living in poverty than indicated by the average MIAF figure. Conversely, *postos* labelled as “better cases” are those where the predicted headcount ratios are significantly smaller (at least 20 per cent lower) than the provincial headcount ratios obtained from the MIAF. Thus, these *postos* are likely to be enjoying better living conditions than those suggested by the MIAF provincial averages.

5 Geographical targeting for poverty alleviation

In this section, I discuss the use of geographical targeting as a poverty alleviation tool. For this purpose, I first present the rationale for using geographical targeting, then describe the different allocation mechanisms typically used in such targeting schemes, and finally assess the performance of two allocation schemes, each based on different criteria.

5.1 Geographical targeting: Why?

The success of poverty alleviation efforts typically depends on their ability properly to identify and target the objective population, i.e. the poor. Ideally, one would like to identify the poor population at the individual

level¹⁴ and to design appropriate targeting programmes. This level of accuracy and efficiency obviously requires large amounts of resources in order to gather information and administer the targeting programmes. With scarce resources and under time pressure to find solutions for the large share of the population living in poverty, most developing countries have put aside “ideal” schemes and are trying instead to find more practical alternatives. Geographical targeting is recognized as one possible solution to the problem of identifying the poor. Instead of aiming to identify and target poor individuals and their households, it is administratively easier and cheaper to steer poverty alleviation efforts to geographical areas where the poor live. Poverty maps, or information in general on the spatial distribution of poverty, can be an important guide to targeting efforts. Geographical targeting also faces some important challenges: it can be very costly and difficult to administer in sparsely populated rural areas, and there is the danger of capture by local élites.

5.2 Allocation mechanism: How?

Information on the spatial distribution of poverty could be an important input to the budget allocation process, but it certainly is not the only relevant input. Development policy goals are usually broader than poverty alleviation alone, and also often guide the allocation of public funds.

Geographical targeting is usually a three-step procedure. First, one decides on the ranking criterion, based on some kind of welfare or poverty measure, to characterize the living conditions of the population. In my case I test the performance of targeting poverty according to predicted headcount rates and a vulnerability indicator. I also assess the results of allocating poverty resources according to the same provincial distribution of resources as used in the most recent national state budget. In the second step, one decides the allocation mechanism, i.e. a rule or criterion to allocate the funds available for poverty alleviation. In order to make a fair comparison of the different welfare indicators, I apply the same allocation rule for all indicators, a simple linear distribution formula given by

$$allocation_i = \frac{Welfareindex_i * Population_i}{\sum_i^N (Welfareindex_i * Population_i)}.$$

The third step is to allocate the funds for a selected geographical level. For example, if one chooses to use the district as the geographical unit for targeting, district i will receive the share of funds given by $allocation_i$.

Dividing the percentage of targeted funds allocated to each district by its total population, I obtain the transfers that each person in district i would receive as a result of a given targeting programme. This is a very simplistic approach, which assumes that every individual in each targeted area receives equal transfer amounts.

5.3 Comparing performance

Poverty measures, such as headcount rates based on consumption expenditures, compare household or per capita consumption expenditure levels with a given measure of what is considered a minimum welfare standard, or the poverty line. In this framework, households or persons with consumption expenditures below the given minimum are considered poor. I compare the performance of different allocation mechanisms by assessing their ability to identify and reach the poorest 20 per cent of households (as identified by the household survey). I calculate leakage rates resulting from each allocation rule. Leakage rates often refer to the share of total programme resources that benefit non-intended beneficiaries, i.e. the non-poor. I estimate leakage rates in order to compare two different ranking criteria: (a) allocation according to the latest national budget, and (b) an allocation based on the predicted poverty measures obtained in my econometric estimations in section 4. The performance analysis is meant to highlight the different results that can be obtained by each allocation rule, and therefore one should not necessarily conclude from the comparison that one allocation criterion is superior to the other. Given that my predicted poverty indicators are estimated from household survey information, one should expect lower leakage rates from this allocation rule.

Using the allocation formula presented earlier, I calculated the per capita percentage of transfers that would be disbursed to each district, in the event that geographical targeting had been used, for each of the ranking criteria. Then I merged, by districts, the information on per capita percentage of transfers with the household-level data from the survey, which contains information on consumption expenditures by household and thus allows us to classify households into five quintiles. By merging these two datasets I was able to compare the transfers received by every household according to their district of residence and to classify them into different consumption expenditure categories. For the comparison, I assumed that the goal of the targeting programme is to reach the poorest quintile of households. Thus, my comparison involved assessing the variation in resources allocated to the lowest quintile (in terms of household

Table 6.6 Distribution of beneficiaries by expenditure quintile

Consumption expenditures	Experiment 1	Experiment 2
	National budget 2001	Predicted poverty
1st quintile (poorest 20 per cent)	0.195	0.426
2nd quintile	0.216	0.207
3rd quintile	0.199	0.149
4th quintile	0.214	0.116
5th quintile (richest 20 per cent)	0.177	0.102

Source: Author's calculations.

consumption expenditure) when geographical targeting is based on different ranking criteria.

Table 6.6 shows the results of the two geographical targeting exercises. Experiment 1 distributes the funds of my hypothetical programme according to the share given in the national state budget for 2001.¹⁵ Table 6.6 shows that this allocation scheme performs less well than using the predicted poverty indicator. If poverty alleviation funds were distributed in the same proportion as allocated in the national state budget for 2001, only 19.5 per cent of beneficiaries would belong to the target population (the poorest 20 per cent of the population). Experiment 2 allocates funds on the basis of the predicted poverty rates obtained from my econometric estimation. This allocation criterion, as expected, produces lower leakage rates. Disbursement based on this targeting criterion will allocate over 40 per cent of the resources to the poorest 20 per cent of the population.

6 Final comments

In this chapter, I have calculated living standard indicators disaggregated at the *posto administrativo* level for Mozambique. I understand this to be one of the first attempts to provide such indicators for the country.¹⁶ I obtained the disaggregated indicators of living conditions by using headcount ratios as my monetary-based indicator for poverty. To obtain disaggregated figures for the headcount ratios at the *posto administrativo* level, I first estimated a probit model using detailed household-level data from a nationwide household survey. Then, with the estimated coefficients, I predicted headcount ratios by using average values of the explanatory variables at the *posto* level. The model for rural areas performs reasonably well in comparing the predicted headcount ratios with the

actual ratios at the provincial level. The ranking of provinces by headcount ratios remains very much the same.

I am also concerned with the regional imbalance in living conditions highlighted in different policy papers. For this purpose, a map disaggregated at the *posto administrativo* level shows the geographical heterogeneity in living conditions and I provide statistical measures of variability. The variation coefficients for predicted headcount ratios are larger at the *posto administrativo* level than for the inter-provincial level, thus confirming the authorities' concerns about regional imbalances in living conditions. Based on a simplistic framework, my exercise in geographical targeting shows how much difference the selection of allocation rules could make when conducting geographical targeting.

One important limitation of my estimates of monetary-based poverty indicators arose from the fact that my data source allowed me to work with only *posto administrativo* averages instead of household unit records. Further research based on unit record data from the census can be used to assess the accuracy of the results presented in this chapter. Set against the potential inaccuracy of my results, the appeal of the methodology presented in this chapter is that it is simple and fast to compute. In addition, it is based on "almost" publicly available information and does not demand special computing efforts from corresponding national statistics offices.

Notes

1. Mozambique was ranked 191 among 206 countries in terms of PPP-adjusted GNP per capita in the *World Development Report 2000/2001*.
2. The new action plan builds on previous documents such as the *Lines of Action for the Eradication of Absolute Poverty* of 1999, the *PARPA 2000–04* (known as the *Interim PRSP*) and the *Government Programme 2000–04*.
3. According to the disaggregation of the most recent national population and housing census.
4. For instance, in MPF (1998) and Government of Mozambique (2001).
5. Unfortunately not at the household or unit level.
6. The FGT family of poverty measures is given by the expression:

$$P_{\alpha} = \frac{1}{N} \sum_{i=1}^N \left(\frac{\min(y_i, z)}{z} \right)^{\alpha}$$

where y is income/expenditures, z is the poverty line and α is a "poverty sensitivity" parameter.

7. The *World Development Report 2000/2001* "accepts the now established view of poverty as encompassing not only low income and consumption but also low achievements in education, health, nutrition and other areas of human development" (World Bank, 2001: v).

8. Unfortunately, I have still not had the opportunity to see the preliminary results of these appraisals.
9. In a companion paper, San Martin (2001) estimates and maps non-expenditure-based poverty indicators for Mozambique.
10. Because the MIAF data were gathered over a period of approximately one year, it was necessary to correct for changes in price levels occurring during this time. In addition, because the sample covered the 10 provinces, the capital city of Maputo and the rural and urban areas, the value of the basic poverty-line basket was also adjusted for the spatial changes in the cost of living.
11. I used the same poverty lines as in MPF's document *Understanding Poverty and Well-being in Mozambique: The First National Assessment* (1998).
12. Owing to the nature of the sample design used to collect the MIAF data, all standard errors in the econometric analysis and in my descriptive statistics were corrected for sample design effects. As I am not interested in marginal effects or elasticities, I report only coefficients and significance levels.
13. Maps similar to figures 6.1 and 6.2 for urban areas are available from the author.
14. Because households may contain both poor and non-poor persons, targeting at the household level is in theory not sufficient.
15. I understand that this is the first time that released national state budget figures have been broken down by province.
16. In parallel work, Simler and Nhate (2002), who have access to unit record information from the same Mozambican population census, are also working on geographically disaggregating income-based poverty measures.

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Poverty, growth and redistribution: A case-study of Iran

Ahmad Assadzadeh and Satya Paul

1 Introduction

During the second half of the twentieth century Iran experimented with alternative development strategies for alleviating poverty. Between 1960 and 1978, the period preceding the Islamic revolution of 1979, a growth-oriented development strategy was followed. It was implicitly assumed that the effects of growth would automatically trickle down to the poor. The income distribution studies conducted by Oshima (1973), Pesaran (1975), Mehran (1977), Sohrabi (1979) and Azimi (1985) reveal that this period saw increasing disparity in the distribution of income/consumption.

The Islamic revolution brought about a new agenda in which a more equitable and just society was promised. The government introduced a taste of “economic and social welfare” ingredients in the development strategy. Between 1984 and 1988, the Iranian government was largely occupied in dealing with economic issues related to the Iran–Iraq war such as inflation, a sharp decline in oil revenues and continued stagnation in production. This gave rise to the lack of a unified position on development policy. After the war (which ended in 1988), the income distribution policy was virtually abandoned. The government adopted the policy of reducing the role of government and promoting a free market economy. It started a dialogue with the International Monetary Fund and the World Bank to introduce a formal programme to liberalize trade and foreign exchange markets and to privatize the economy.

There is, however, no serious study that examines the changes in the extent of poverty in the post-Islamic period. The present study fills this gap by investigating temporal changes in poverty in the rural and urban sectors over a period of 10 years, from 1983 to 1993. In particular, we analyse the relative contributions of growth and redistribution factors to the changes in poverty during this period. The study is based on household-level data relating to three household income and expenditures surveys (1983, 1988 and 1993) conducted by the Statistical Centre of Iran. Each survey year falls within a particular policy regime. The 1983 survey belongs to a welfare-oriented revolutionary period, the 1988 survey relates to a period during which the Iranian economy was totally exhausted by the war, and the 1993 survey relates to the period of economic reforms and rapid growth. Although our analysis of poverty based on these survey data may not prove any causality between the government development policies and changes in poverty, it will at least hint at how growth and redistribution factors contribute to the observed changes in poverty during different policy regimes.

The chapter is organized as follows. Section 2 presents a brief discussion on the issues involved in measuring poverty. Section 3 investigates the temporal changes in levels of poverty in the rural and urban sectors in Iran. This is followed by a sensitivity analysis in section 4 and a dominance test in section 5, which enable us to see the robustness of our poverty comparisons to the choice of alternative poverty lines. Section 6 decomposes the temporal changes in poverty into components associated with growth and redistribution factors. Section 7 explores regional and occupational differences in levels of poverty. An analysis of poverty and income inequality is presented in section 8. Section 9 summarizes and brings together the main findings.

2 Issues in measuring absolute poverty

Two issues are involved in measuring poverty. The first relates to the identification of the poor and the second to the aggregation of poverty using available information on the poor. The former requires the construction of a monetary poverty line and the latter requires an aggregate measure capturing all available information on the poor.

2.1 The construction of a poverty line

To the best of our knowledge, there does not exist any monetary poverty line for Iran. In the past, two indirect criteria were used by Azimi (1992)

to identify poverty. According to his first criterion, living in one room is an indication of severe poverty, and living in two rooms is an indication of relative poverty. Based on the 1986 housing census data, he finds that about 4.6 million households (21.0 million persons) lived in severe poverty. Out of these, 2.4 million households (10.3 million persons) lived in urban areas and the rest lived in rural areas. The identification of poverty on the basis of the size of accommodation has one serious problem. It assumes that, if a person does not suffer from housing deprivation, they also do not suffer from nutritional and other deprivations. This may not be true. A family may live in a big inherited house but may not be able to earn sufficient income to afford other basic needs such as food and clothing. On the other hand, a family living in small accommodation may well earn sufficient to purchase all the basic and necessary items of consumption.

The second criterion proposed by Azimi is based on his belief that individuals or households are poor if they are supported by governmental or non-governmental charity organizations. Using this criterion, Azimi reports that 1.56 million households (3.16 million persons) lived in poverty in 1986. Identification of poverty based on this criterion has its own problems. It is true that these organizations seek donations and distribute them among the poor; but there is little information on the size and coverage of aid by non-governmental organizations to the poor. Even if we collect such information accurately, the estimates of the poverty profile thus obtained are likely to be underestimated, because many families, though poor, do not take aid from charities for social and cultural reasons.

We follow a balanced diet (basic needs) approach to construct monetary poverty lines for the rural and urban sectors separately. The cost of a balanced diet (recommended by the Iranian Institute of Nutrition Science and Food Industry) satisfying normal nutritional requirements at 1989 prices is 98,905 rials for the rural sector and 123,296 rials for the urban sector (see Rahimi and Kalantary, 1992). We add the non-food poverty component to this using the ratio of non-food expenditure to food expenditure (at the average level). This gives us the poverty lines at 1989 prices. These are then converted to 1983 prices using the consumer price indices separately for the rural and urban sectors. As expected, the poverty line for the urban sector is higher than for the rural sector (see table 7.1). We may note that the balanced diet approach is one of the many objective and subjective methods of specifying poverty lines. A review of these approaches is provided in Ravallion (1994) and Paul (1989, 1999). The approach adopted here is quite simple and free from subjective elements.

Table 7.1 Estimates of poverty lines for Iran

Sector	Per capita cost of balanced diet at 1989 prices (rials) ^a	Ratio of non-food expenditure to food expenditure (average level) in 1989 ^b	Non-food component of poverty line at 1989 prices	Poverty line at 1989 prices	Poverty line at 1983 prices ^c
Rural	98,905	0.587	58,057	156,962	66,202
Urban	123,296	1.00	123,296	246,592	87,426

Sources:

a. Estimated by Rahimi and Kalantary (1992).

b. Obtained from the Household Income and Expenditure Survey, Statistical Centre of Iran (1989).

c. Obtained by using consumer price indices for 1989 and 1983 separately for the rural and urban sectors.

2.2 The choice of poverty measures

The literature on aggregate measures of poverty is quite large (for reviews, see Atkinson, 1987; Kakwani, 1980, 2000; Paul, 1999; Ravallion, 1994; and Sen, 1997). For our empirical exercise, we choose three widely used measures, namely the headcount ratio (H), the poverty gap ratio (P_{gap}) and the Foster–Greer–Thorbecke (FGT) poverty index.

The headcount ratio is defined as:

$$H = q/n, \quad (7.1)$$

where q is the number of persons whose income lies below the poverty line and n is the total population. The poverty gap ratio (P_{gap}) is defined as:

$$P_{\text{gap}} = \frac{1}{n} \sum_{i=1}^q \left(\frac{z - x_i}{z} \right), \quad (7.2)$$

where z is the poverty line and x_i is the i 'th lowest income in the population. The P_{gap} measure has a useful interpretation as the average fraction of the poverty-line income that would be required to be redistributed in order to eradicate poverty under the assumption of perfect targeting.

The Foster, Greer and Thorbecke (1984) class of poverty measures is given by:

$$FGT(\alpha) = \frac{1}{n} \sum_{i=1}^q \left(\frac{z - x_i}{z} \right)^{\alpha} \quad \alpha > 1 \quad (7.3)$$

where α is a parameter. The larger the value of α , the greater the weight given to the severity of poverty. We may note that, for $\alpha = 0$, the *FGT* index reduces to H and for $\alpha = 1$ to P_{gap} . H and P_{gap} are not sensitive to income transfers among the poor, whereas *FGT*(2) is. Sensitivity to income transfers among the poor is a very desirable property of a poverty measure. It may further be noted that all three measures are additively decomposable. This enables us to examine the relative contributions of different population subgroups to overall poverty. We shall return to this issue in section 7.

3 The extent of poverty in Iran, 1983–1993

As mentioned above, the study utilizes unit record data relating to the household income and expenditure (HIE) surveys conducted by the Statistical Centre of Iran during 1983, 1988 and 1993. Each survey covers the entire rural and urban sectors. Details of the surveys are provided in Assadzadeh (1997). All the income data relating to the 1988 and 1993 surveys were expressed in 1983 prices using consumer price indices separately for the rural and urban sectors. Table 7.2 presents the sample size and some summary statistics, such as mean per capita income (at 1983 prices) and the Gini coefficient of the per capita household income distribution among persons. As expected, per capita income is higher in the urban sector than in the rural sector. Over the period of 10 years, real per capita incomes in the rural sector increased whereas those in the urban sector declined. Consequently, the rural–urban disparity in mean per capita income has narrowed. There is, however, an increase in income inequality (measured in terms of the Gini coefficient) in each sector over the period.

Table 7.2 Basic statistics of sample HIE survey data

	1983 survey	1988 survey	1993 survey
<i>Rural sector</i>			
Sample size	12,321	4,298	5,954
Mean per capita income (rials)	86,785	77,855	92,910
Gini coefficient	0.3871	0.3906	0.4102
<i>Urban sector</i>			
Sample size	14,683	3,956	6,733
Mean per capita income (rials)	176,861	109,639	157,149
Gini coefficient	0.3826	0.3851	0.4198

Source: Authors' calculations.

Table 7.3 Estimates of poverty in Iran, 1983–1993

Year	Rural sector			Urban sector		
	<i>H</i>	<i>P</i> _{gap}	<i>FGT</i> (2)	<i>H</i>	<i>P</i> _{gap}	<i>FGT</i> (2)
1983	0.473	0.188	0.103	0.241	0.083	0.044
1988	0.552	0.218	0.117	0.512	0.194	0.100
1993	0.464	0.184	0.099	0.338	0.117	0.056
<i>Percentage change in poverty measures</i>						
1983–88	16.7	16.0	13.6	112.4	133.7	127.3
1988–93	–15.9	–15.6	–15.4	–34.0	–39.7	–44.0
1983–93	–1.9	–2.1	–3.9	40.2	41.0	27.3

Source: Authors' calculations.

Table 7.3 presents the estimates of the headcount ratio, the poverty gap ratio and the *FGT*(2) poverty index separately for the rural and urban sectors. As can be seen from this table, the level of poverty was more severe in the rural sector than in the urban sector in 1983: about 47 per cent of the rural population lived in poverty, while the corresponding figure for the urban sector was 24 per cent; the estimates of the poverty gap ratio and the *FGT*(2) index for the urban sector are less than half those of their rural counterparts. Both the sectors experienced an increase in the extent of poverty between 1983 and 1988. This was mainly owing to war, economic recession and the drop in oil revenue, which adversely affected average incomes (see table 7.2). Had the government not provided a safety net to the poor by subsidizing basic needs through widespread rationing, the effect of economic hardship on the poor would have been worse.

During this period, urban poverty rose more than rural poverty. This could be because the widespread inflationary recession during this period eroded the purchasing power of urban households and pushed people in the middle- and low-income strata below the poverty line. Rural households, in contrast, were able to shield themselves against inflation because they were to some extent self-sufficient through producing most of their food items, which otherwise would have been purchased at high prices.

The war with Iraq ended in 1988. This was followed by economic recovery measures and reforms, which enhanced the per capita income of both poor and non-poor households. Consequently, both urban and rural sectors experienced a decline in poverty between 1988 and 1993. The rural–urban gap in poverty also declined during this period. The estimates of *P*_{gap} provide some useful guidance for designing policy interventions aimed at alleviating poverty. The minimum cost of eliminating

poverty using targeted transfers is the sum of all poverty gaps. The cost would be:

$$\sum_{i=1}^q (z - x_i) = n \cdot z \cdot P_{\text{gap}}. \quad (7.4)$$

We provide here an empirical illustration for 1993. For the rural sector, $P_{\text{gap}} = 0.184$. Multiplying by the rural population ($n = 25$ million) and the poverty line ($z = 66,202$ rials) gives 304.5 billion rials as the amount required for alleviating poverty by targeted transfers to the poor. This represents 2 per cent of Iran's GDP in 1993. Similarly, given a population of 34 million in the urban sector (57 per cent of total population) and a poverty line of 87,426 rials, the poverty gap ratio of 0.117 would imply 347.8 billion rials as the cost of eliminating poverty under perfectly targeted transfers in the urban sector. This amounts to 2.3 per cent of Iran's GDP in 1993. The elimination of poverty with these resources assumes that policy makers have a lot of information. However, if the policy makers do not know who are the poor and who are not, then they would have to give z to everyone to ensure that poverty is eliminated. The cost is then $n \cdot z$ and indicates the maximum cost of eliminating poverty with no targeting. The P_{gap} index is simply the ratio of the minimum cost of eliminating poverty with perfect targeting to the maximum cost with no targeting.

4 Sensitivity analysis

In the previous section, we used a single poverty line to assess changes over time in poverty in each sector. However, it would be interesting to undertake sensitivity analysis to see whether observed cross-sector and temporal patterns are robust to changes in the poverty line. To this end we recalculated the H , P_{gap} and $FGT(2)$ measures for alternative poverty lines set at 10 per cent below and above the original line.

The estimates presented in table 7.4 show the same cross-sector and temporal patterns as before, confirming that the analysis and findings presented so far are not sensitive to the exact position of the poverty line.

5 Dominance tests

Although the sensitivity analysis is useful in analysing the robustness of poverty to small changes in the location of the poverty line, the dominance tests allow us to expand the enquiry to cover a wider range of

Table 7.4 Estimates of poverty based on alternative poverty lines

Year	Rural sector			Urban sector		
	H	P_{gap}	$FGT(2)$	H	P_{gap}	$FGT(2)$
<i>Poverty line increased by 10 per cent</i>						
1983	0.531	0.407	0.120	0.286	0.349	0.052
1988	0.608	0.413	0.137	0.574	0.394	0.120
1993	0.517	0.409	0.116	0.393	0.355	0.069
<i>Poverty line decreased by 10 per cent</i>						
1983	0.411	0.387	0.086	0.200	0.342	0.036
1988	0.486	0.381	0.097	0.450	0.361	0.082
1993	0.407	0.383	0.083	0.289	0.328	0.045

Source: Authors' calculations.

poverty lines. To carry out these tests, one has first to plot the entire distribution curves for the sectors, regions, occupation groups or years to be compared. Plotting per capita household income on the horizontal axis and the cumulative percentage of the population at successive levels of per capita household income on the vertical axis traces a "poverty incidence curve" (PIC). If this curve for, say, year 1 lies entirely to the right and below that for year 2, then one can infer that poverty has unambiguously increased between year 1 and 2, regardless of where one draws the poverty line and regardless of the poverty measure used (assuming the measure has certain basic desirable properties). This is called the first-order dominance (FOD) test.

If the two poverty incidence curves intersect, then some poverty lines and poverty measures are likely to rank them differently. In this situation one has to impose some restrictions on the structure of the poverty measure. If we restrict attention to the decomposable poverty measures, P_{gap} and $FGT(2)$, which reflect respectively the depth and severity of poverty, then the second- and third-order dominance conditions can be applied to rank the poverty levels. The second-order dominance condition would say that, if the area under the poverty deficit curve (given by the area under the cumulative distribution) for year 1 is lower than that for year 2, then there is an unambiguous increase in poverty from year 1 to year 2. If this test fails (i.e. the two curves intersect), then we can apply the third-order dominance test, which requires that, for unambiguous comparison of poverty for all poverty lines, the poverty severity curve is everywhere higher in one of the two situations being compared. For further discussion on dominance tests, see Ravallion (1994).

We begin with the comparison of the poverty incidence curves for the rural and urban sectors for 1983, 1988 and 1993, respectively, in figures 7.1 to 7.3. For each period, the poverty incidence curve for the rural

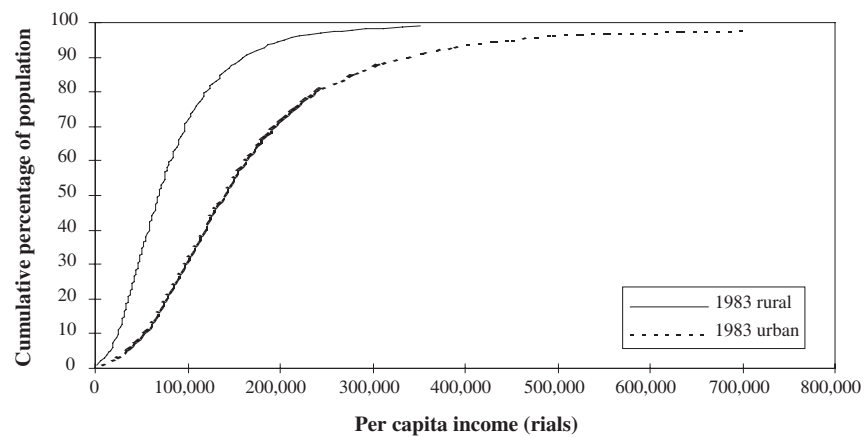


Figure 7.1 Poverty incidence curves for the rural and urban sectors in 1983

sector is entirely to the left of the urban one, indicating that the incidence of poverty in the rural sector is greater than that in the urban sector for all poverty lines and all admissible poverty measures.

To test the robustness of our results on temporal changes in poverty, the poverty incidence curves of different periods are compared for each sector separately. Figure 7.4 shows that poverty in the rural sector unambiguously increased between 1983 and 1988: the 1988 distribution is entirely to the left of the 1983 one. In contrast, figure 7.5 reveals that between 1988 and 1993 poverty unambiguously decreased: the 1993 distribution falls entirely to the right and below the 1988 one. This is also

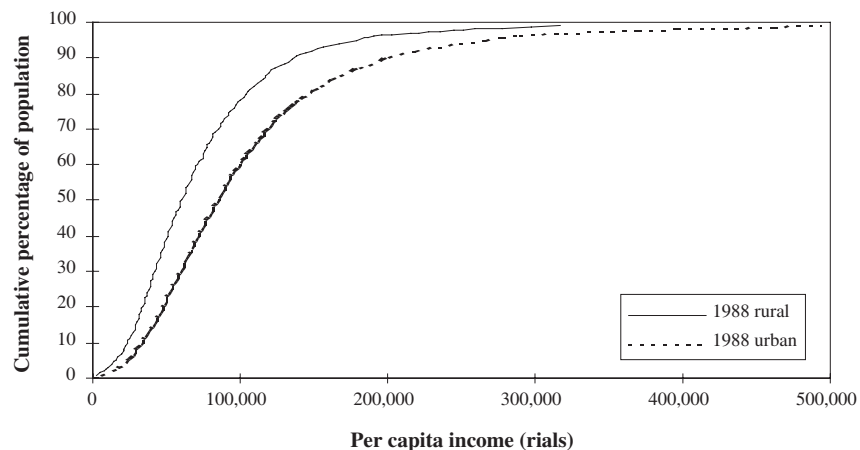


Figure 7.2 Poverty incidence curves for the rural and urban sectors in 1988

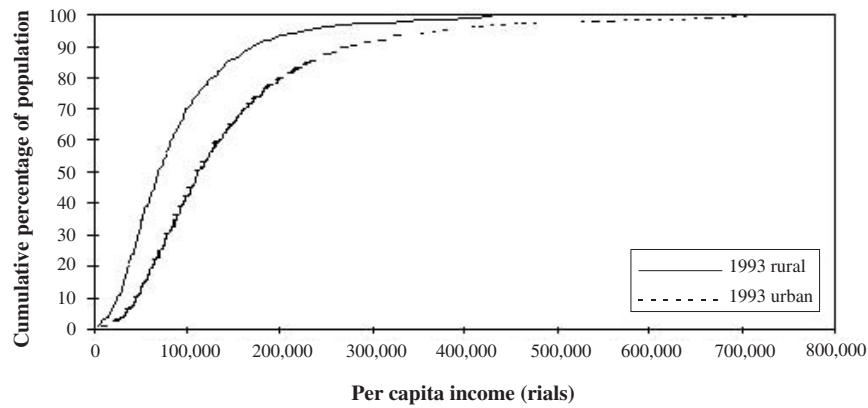


Figure 7.3 Poverty incidence curves for the rural and urban sectors in 1993

the case for the entire period 1983–1993, as illustrated in figure 7.6, though the dominance is less pronounced at the lower end of the distribution.

Similarly figure 7.7 shows that urban poverty increased between 1983 and 1988 for the entire range of poverty lines. Moreover, the evidence of a decline in poverty between 1988 and 1993 is robust, as revealed in figure 7.8. The dominance test for the overall increase in the level of

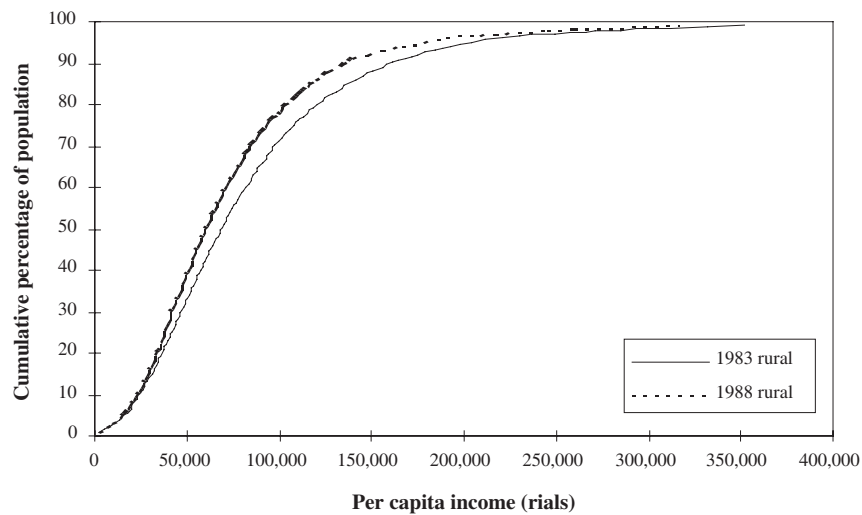


Figure 7.4 Poverty incidence curves for the rural sector, 1983–1988

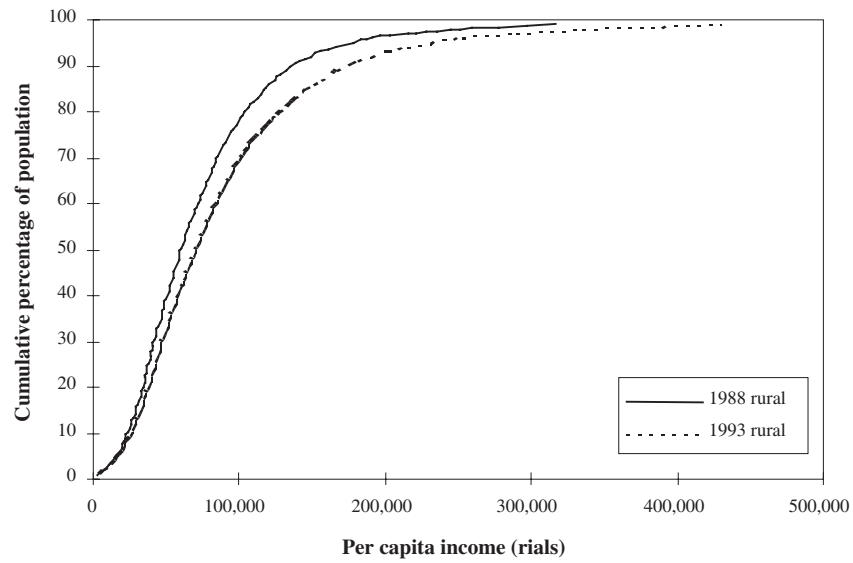


Figure 7.5 Poverty incidence curves for the rural sector, 1988–1993

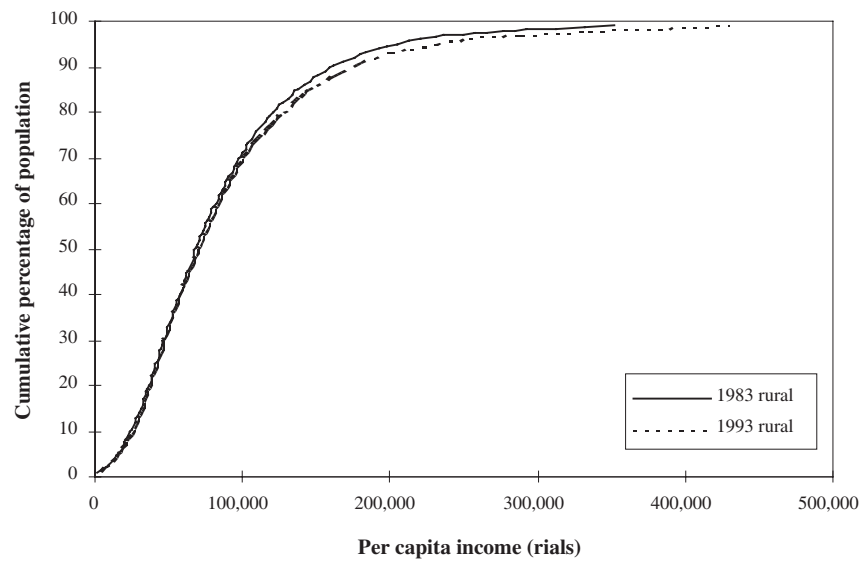


Figure 7.6 Poverty incidence curves for the rural sector, 1983–1993

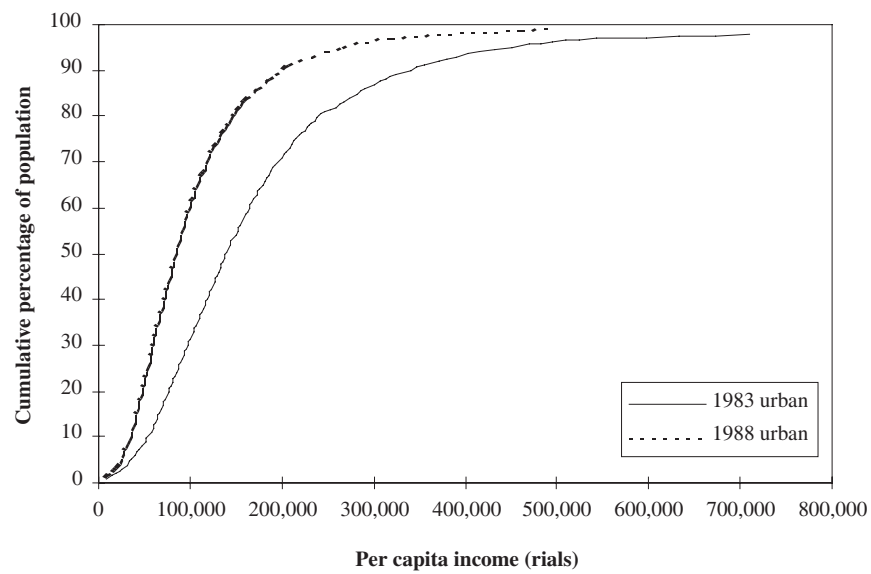


Figure 7.7 Poverty incidence curves for the urban sector, 1983–1988

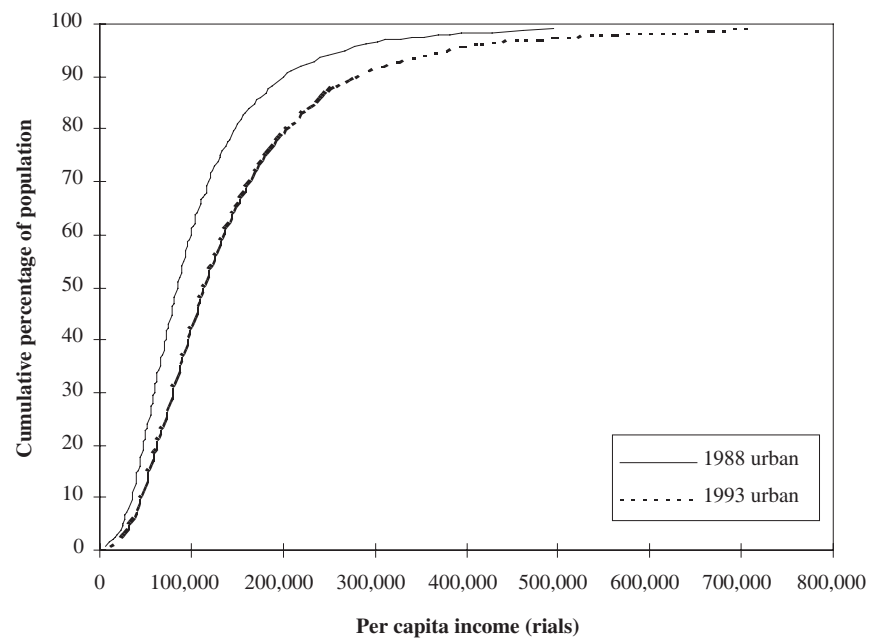


Figure 7.8 Poverty incidence curves for the urban sector, 1988–1993

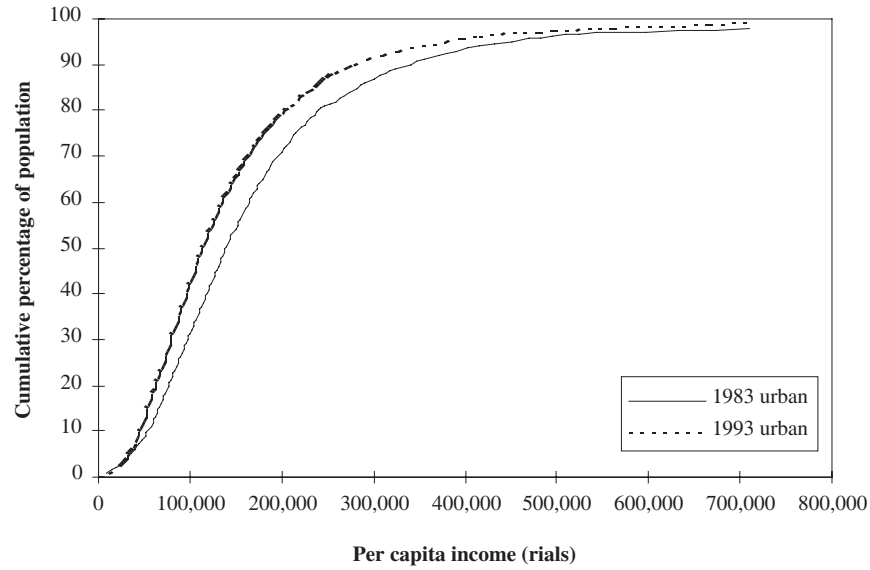


Figure 7.9 Poverty incidence curves for the urban sector, 1983–1993

poverty in the urban sector during 1983–1993 is very clear, except at the very bottom where the two poverty incidence curves intersect (at about 1 per cent of the population) (fig. 7.9).

6 Growth and redistribution components of poverty

In order to see how growth and redistribution policies have affected poverty during the period of study, we decompose the changes in poverty into components associated with growth, redistribution and a residual (Datt and Ravallion, 1991):

$$P^{t+s} - P^t = P^{t+s^*} - P^t + P^{t+s^{**}} - P^{t+s^*} + \text{Residual} \quad (3.4)$$

Growth effect: Change in poverty given change in mean income holding period t Lorenz curve constant	+ Redistribution effect: Change in poverty given shift in the Lorenz curve holding period t mean income constant	+ Interaction between effects of growth and changes in distribution
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where P^{t+s^*} denotes the predicted value of the poverty index in period $t + s$ if only mean income changed since period t but relative income levels

remained unchanged, i.e. P^{t+s^*} is obtained by applying the $(t+s)$ mean to the (t) Lorenz curve. Similarly, $P^{t+s^{**}}$ denotes the poverty level in $t+s$ if the Lorenz curve had shifted since (t) but mean income remained unchanged. In general, the residual does not vanish. It can vanish only if the mean income or the Lorenz curve remains unchanged over the decomposition period. This is very unlikely for most empirical work.

Since we are interested in the redistribution effect on poverty, it would be more appropriate to rely on the transfer-sensitive measure, $FGT(2)$. However, for the sake of comparison, in table 7.5 we present the contributions of growth and redistribution to changes in poverty using all three measures. The table shows that for the period 1983–1988 the growth component is positive and the redistribution component is negative in both sectors, using $FGT(2)$. This indicates that a decline in per capita household income, mainly owing to war and economic recession, contributed to the increase in poverty in both sectors. Poverty would have deteriorated further had redistribution factors not improved the conditions of the poor.

Between 1988 and 1993 the growth component became negative but the redistribution factor became positive in both sectors. This suggests that the growth of income during this period of economic reforms would have reduced poverty more than the reduction observed had redistribution not been unfavourable to the poor. For the entire period 1983–1993 the growth component is negative and the redistribution component is positive in the rural sector. This implies that rural poverty would have been lower in 1993 had the government taken adequate measures not to let the distribution deteriorate. In the urban sector, both growth and redistribution components are positive for the entire period. This suggests that, if the government had maintained the same level of inequality over the years, the overall increase in urban poverty would have been lower than that observed.

Finally, it is worth noting that the signs of the growth components are invariant to the choice of poverty measures. The signs of the redistribution component based on H and P_{gap} are different from those based on the $FGT(2)$ measure in some cases. This should not surprise us because H and P_{gap} measures are insensitive to income transfers among the poor. The upshot is that the growth component is by far the more important factor in each sub-period, and over the whole period too, though less so.

7 A profile of poverty

We now make use of the decomposition property of the poverty measures to investigate the relative contributions of different occupations and

Table 7.5 Decomposition of poverty into growth and redistribution components

Period	Rural sector				Urban sector			
	Growth component	Redistribution component	Residual	Total	Growth component	Redistribution component	Residual	Total
H								
1983–1988	0.065	0.011	0.003	0.078	0.259	0.004	0.008	0.271
1988–1993	–0.105	0.010	0.008	–0.087	–0.209	0.038	–0.003	–0.175
1983–1993	–0.041	0.027	0.004	–0.009	0.053	0.032	0.011	0.096
P_{gap}								
1983–1988	0.020	–0.006	0.001	0.014	0.060	–0.006	0.003	0.057
1988–1993	–0.032	0.016	–0.001	–0.017	–0.052	0.014	–0.006	–0.044
1983–1993	–0.011	0.009	–0.001	–0.003	0.011	–0.001	0.004	0.013
$FGT(2)$								
1983–1988	0.033	–0.004	0.002	0.031	0.110	–0.005	0.006	0.111
1988–1993	–0.054	0.019	0.001	–0.035	–0.094	0.023	–0.007	–0.078
1983–1993	–0.019	0.016	–0.001	–0.004	0.021	0.006	0.006	0.033

Source: Authors' calculations.

regions to aggregate poverty. If we classify the population of households into mutually exclusive subgroups, then an aggregate measure of poverty can be written as the weighted sum of subgroup poverty measures. That is, if an aggregate poverty measure is denoted by P , the subgroup-specific measures by P_j ($j = 1, \dots, m$), and the share of the j 'th group in the total population by w_j , then $P = \sum w_j P_j$, where $w_j P_j$ denotes the contribution of the j 'th group to aggregate poverty.

For the regional profile, the sample households in each sector are classified into eight geographical regions: north-western, western, northern, south-western, southern, central, north-eastern and south-eastern. For the occupational profile, the sample households are classified (based on the occupation of the household head) into seven mutually exclusive occupational categories: professionals, clerks, merchants, service workers, farmers, production workers and miscellaneous occupations. For further details on the occupational and regional classification, see Assadzadeh (1997: chap. 3).

7.1 A regional profile of poverty

The top panel in table 7.6 presents the regional profile of poverty in the rural sector and the lower panel displays the percentage contribution of each region to total poverty. As can be seen from this table, the incidence of poverty in the rural sector varies a great deal across different regions. During all three periods, the south-eastern region showed a very high incidence of poverty. The poor constituted 54, 70 and 67 per cent of the population in 1983, 1988 and 1993 respectively. The western, south-western and north-eastern regions were also relatively poor. A high incidence of poverty in the south-eastern region is not a surprise. This region is economically the most underdeveloped region of Iran. Owing to its dry climate, agribusiness does not thrive here. Also, it has attracted hardly any development funds from the government. All these factors transformed this region into the poorest region of the country. It is worth noting that in 1988 (the year of economic recession and the end of the war) all regions showed higher levels of poverty in the rural sector. Some regions were hit more than others. The western and the south-western regions (the border regions with Iraq) recorded the largest increase in poverty between 1983 and 1988. The devastating effect of the war in these regions greatly reduced the income of households and drove them below the poverty line. In contrast, the central, north-eastern and southern regions – being geographically away from the Iraqi border – recorded only a minimal increase in the incidence of poverty.

The lower panel of table 7.6 shows that in 1983 the western and northern regions contributed most to overall poverty (18 per cent and 17 per cent on the $FGT(2)$ index). In 1988, the western and the south-

Table 7.6 Regional breakdown of the extent of poverty in the rural sector, 1983–1993

Year	Poverty index	North-western	Western	Northern	South-western	Southern	Central	North-eastern	South-eastern	All regions
1983	H	0.411	0.576	0.374	0.520	0.459	0.461	0.552	0.542	0.473
	P^{gap}	0.129	0.225	0.140	0.226	0.177	0.196	0.231	0.233	0.188
	$FGT(2)$	0.061	0.121	0.074	0.130	0.098	0.111	0.130	0.132	0.103
1988	H	0.510	0.717	0.403	0.671	0.459	0.473	0.565	0.704	0.552
	P^{gap}	0.172	0.305	0.139	0.279	0.179	0.188	0.216	0.322	0.218
	$FGT(2)$	0.075	0.169	0.070	0.152	0.100	0.101	0.114	0.185	0.117
1993	H	0.514	0.542	0.398	0.562	0.459	0.334	0.586	0.668	0.464
	P^{gap}	0.178	0.198	0.143	0.268	0.183	0.127	0.279	0.283	0.184
	$FGT(2)$	0.087	0.095	0.071	0.168	0.101	0.066	0.171	0.169	0.099
<i>Percentage contribution to poverty</i>										
1983	H	8.3	18.1	18.7	9.6	11.8	12.4	10.0	11.0	100.0
	P^{gap}	6.5	17.9	17.7	10.6	11.5	13.3	10.6	12.0	100.0
	$FGT(2)$	5.7	17.5	17.1	11.1	11.5	13.8	10.9	12.4	100.0
1988	H	12.5	17.4	16.7	9.4	7.6	6.8	11.5	18.0	100.0
	P^{gap}	10.7	18.7	14.6	9.9	7.5	6.8	11.1	20.8	100.0
	$FGT(2)$	8.8	19.4	13.8	10.1	7.9	6.8	11.0	22.3	100.0
1993	H	6.3	19.2	21.5	8.5	15.1	12.7	12.7	4.1	100.0
	P^{gap}	5.5	17.7	19.5	10.3	15.2	12.2	15.3	4.4	100.0
	$FGT(2)$	5.0	15.8	17.9	11.9	15.5	11.8	17.4	4.8	100.0

Source: Authors' calculations.

eastern regions became the largest contributors to overall poverty. In 1993, the northern region was the main contributor to overall inequality in the rural sector (18 per cent on the *FGT*(2) index). A sharp decline in the contribution of the south-eastern region to poverty in 1993 was due to a change in population size, because the poverty level in this region remained relatively high compared with other regions.

In the urban sector, the south-eastern region was one of the poorest during all three years (34, 65 and 51 per cent of the population were poor in 1983, 1988 and 1993, respectively). In 1983, the western, south-western, north-eastern and north-western regions were relatively poor regions. In 1988, the poverty incidence sharply increased (more than doubled) in all regions. The western region recorded the highest incidence of poverty (69 per cent). This was mainly because, during the war, its economy came to a standstill and all economic projects were stopped. However, this is not to say that the economic burden of war was not shared by other regions. Between 1988 and 1993, the incidence of poverty in the urban sector declined in all regions. This could be because, with the end of the war in 1988 and the recovery of oil revenues, economic growth picked up and poverty fell. Although poverty increased in all regions during 1983–1993, relatively high poverty in the south-eastern region suggests the need for greater attention to redressing poverty in this region. The lower panel of table 7.7 displays the contribution of each region to aggregate urban poverty. The western and northern regions consistently contributed most to overall poverty. In 1993, the north-western and south-eastern regions contributed least to overall poverty in the urban sector.

7.2 An occupational profile of poverty

In the rural sector, the incidence of poverty was highest among farmers and the miscellaneous occupations group and lowest among professionals in 1983 (table 7.8). All of the occupations experienced an increase in their poverty levels in 1988. The largest poverty incidence in 1988 was recorded for the miscellaneous occupations group ($H = 0.71$). In 1993, all occupation groups experienced a decline in poverty. It may also be noted that farmers contributed most to overall poverty in all three periods (73, 66 and 65 per cent based on *FGT*(2) in 1983, 1988 and 1993, respectively). The production workers group and the miscellaneous occupations group made the next highest contribution to overall poverty. As expected, the contributions of professionals, clerks and service workers to poverty are the lowest. The occupational profile of poverty in the urban sector is quite similar to that in the rural sector. There is, however, one major difference. Unlike the rural sector, production workers contribute most to poverty in the urban sector (table 7.9).

Table 7.7 Regional breakdown of the extent of poverty in the urban sector, 1983–1993

Year	Poverty index	North-western	Western	Northern	South-western	Southern	Central	North-eastern	South-eastern	All regions
1983	H	0.255	0.340	0.162	0.270	0.238	0.216	0.264	0.336	0.241
	P_{gap}	0.078	0.118	0.056	0.100	0.080	0.080	0.088	0.115	0.083
	$FGT(2)$	0.037	0.060	0.030	0.055	0.039	0.044	0.048	0.059	0.044
1988	H	0.541	0.686	0.360	0.642	0.586	0.461	0.588	0.647	0.512
	P_{gap}	0.193	0.321	0.109	0.243	0.221	0.159	0.234	0.288	0.194
	$FGT(2)$	0.093	0.187	0.048	0.119	0.115	0.080	0.120	0.164	0.100
1993	H	0.323	0.437	0.250	0.476	0.344	0.275	0.444	0.513	0.338
	P_{gap}	0.095	0.163	0.079	0.179	0.126	0.082	0.160	0.205	0.117
	$FGT(2)$	0.038	0.079	0.038	0.091	0.062	0.037	0.079	0.107	0.056
<i>Percentage contribution to poverty</i>										
1983	H	11.5	18.9	18.6	12.4	9.5	11.6	8.1	9.4	100.0
	P_{gap}	10.2	19.0	18.6	13.3	9.3	12.5	7.8	9.3	100.0
	$FGT(2)$	9.3	18.4	19.2	14.0	8.6	13.2	8.1	9.2	100.0
1988	H	9.8	11.4	24.8	8.0	8.9	8.2	9.8	19.0	100.0
	P_{gap}	9.2	14.1	19.8	8.0	8.9	7.5	10.3	22.3	100.0
	$FGT(2)$	8.6	15.8	17.0	7.6	8.9	7.3	10.2	24.6	100.0
1993	H	4.0	18.9	23.7	8.7	14.9	13.1	14.0	2.8	100.0
	P_{gap}	3.4	20.5	21.7	9.4	15.8	11.3	14.7	3.2	100.0
	$FGT(2)$	2.8	20.6	21.4	10.0	16.2	10.6	15.0	3.5	100.0

Source: Authors' calculations.

Table 7.8 Occupational breakdown of the extent of poverty in the rural sector, 1983–1993

Year	Poverty index	Professionals	Clerks	Merchants	Service workers	Farmers	Production workers	Miscellaneous occupations	All occupations
1983	<i>H</i>	0.064	0.173	0.305	0.223	0.535	0.327	0.657	0.473
	<i>P_{gap}</i>	0.026	0.054	0.114	0.070	0.212	0.108	0.342	0.188
	<i>FGT(2)</i>	0.013	0.024	0.060	0.034	0.115	0.053	0.225	0.103
1988	<i>H</i>	0.145	0.250	0.375	0.327	0.588	0.511	0.713	0.552
	<i>P_{gap}</i>	0.047	0.053	0.111	0.094	0.233	0.182	0.378	0.218
	<i>FGT(2)</i>	0.021	0.025	0.045	0.038	0.123	0.090	0.248	0.117
1993	<i>H</i>	0.130	0.213	0.286	0.278	0.499	0.398	0.680	0.464
	<i>P_{gap}</i>	0.038	0.049	0.082	0.085	0.200	0.128	0.374	0.184
	<i>FGT(2)</i>	0.018	0.016	0.036	0.036	0.107	0.058	0.255	0.099
<i>Percentage contribution to poverty</i>									
1983	<i>H</i>	0.2	0.5	2.2	1.5	73.9	13.4	8.3	100.0
	<i>P_{gap}</i>	0.2	0.4	2.0	1.2	74.1	11.2	10.9	100.0
	<i>FGT(2)</i>	0.2	0.3	2.0	1.1	73.3	10.1	13.2	100.0
1988	<i>H</i>	0.6	0.4	2.9	2.1	66.9	17.6	9.5	100.0
	<i>P_{gap}</i>	0.5	0.2	2.2	1.5	67.1	15.8	12.8	100.0
	<i>FGT(2)</i>	0.4	0.2	1.6	1.1	66.4	14.6	15.7	100.0
1993	<i>H</i>	0.5	0.3	2.8	1.8	64.3	19.4	10.9	100.0
	<i>P_{gap}</i>	0.4	0.2	2.0	1.4	65.0	15.8	15.2	100.0
	<i>FGT(2)</i>	0.4	0.1	1.6	1.1	64.6	13.2	19.1	100.0

Source: Authors' calculations.

Table 7.9 Occupational breakdown of the extent of poverty in the urban sector, 1983–1993

Year	Poverty index	Professionals	Clerks	Merchants	Service workers	Farmers	Production workers	Miscellaneous occupations	All occupations
1983	<i>H</i>	0.040	0.084	0.217	0.165	0.435	0.247	0.337	0.241
	<i>P_{gap}</i>	0.011	0.017	0.061	0.046	0.177	0.072	0.160	0.083
	<i>FGT(2)</i>	0.005	0.006	0.025	0.019	0.102	0.031	0.103	0.044
1988	<i>H</i>	0.246	0.321	0.419	0.588	0.678	0.571	0.568	0.512
	<i>P_{gap}</i>	0.070	0.083	0.144	0.189	0.326	0.205	0.270	0.194
	<i>FGT(2)</i>	0.031	0.032	0.069	0.079	0.188	0.100	0.167	0.100
1993	<i>H</i>	0.107	0.163	0.286	0.417	0.502	0.391	0.382	0.338
	<i>P_{gap}</i>	0.027	0.042	0.086	0.138	0.200	0.131	0.158	0.117
	<i>FGT(2)</i>	0.009	0.017	0.037	0.061	0.104	0.060	0.091	0.056
<i>Percentage contribution to poverty</i>									
1983	<i>H</i>	1.3	2.4	14.6	5.0	17.4	37.9	21.4	100.0
	<i>P_{gap}</i>	1.1	1.4	11.9	4.0	20.5	31.7	29.3	100.0
	<i>FGT(2)</i>	0.9	1.0	9.3	3.2	22.7	26.8	36.1	100.0
1988	<i>H</i>	4.6	3.5	12.7	8.1	10.9	44.1	16.0	100.0
	<i>P_{gap}</i>	3.4	2.4	11.5	6.9	13.8	41.8	20.1	100.0
	<i>FGT(2)</i>	2.9	1.8	10.7	5.6	15.4	39.5	24.1	100.0
1993	<i>H</i>	3.3	2.9	14.2	6.9	10.5	43.8	18.3	100.0
	<i>P_{gap}</i>	2.4	2.2	12.3	6.7	12.1	42.5	21.9	100.0
	<i>FGT(2)</i>	1.7	1.8	11.0	6.0	13.1	40.2	26.2	100.0

Source: Authors' calculations.

8 An analysis of poverty and income inequality

The rural sector shows a much higher level of poverty than the urban sector. Rural per capita income was much lower than urban per capita income during the entire period of study. Incomes were more unequally distributed in the rural sector than in the urban sector. Both these factors seem to contribute to the observed differences in poverty between the two sectors. The incidence of poverty among rural farmers is about 50 per cent, which contributes about two-thirds to overall rural poverty. More than half of the Iranian land is desert and rainfall is quite irregular. These factors and the lack of other business opportunities in the rural sector explain why about half of farmers do not earn sufficient income to meet the basic needs of life. The western and south-western regions, which are on the border of Iraq, were hit the hardest by the war. The war was accompanied by economic recession and a drop in oil revenue and exports, which greatly reduced the ability of the government to provide a safety net to the poor.

Both poverty and income inequality persisted throughout the period of this study. Can the lack of a consistent development strategy and political will be responsible for this? If we look at the history of the development policies adopted in Iran, there was hardly any consistency in the growth and development strategy pursued by the government. Since 1972, the Plan and Budget Organization has designed over half a dozen development plans, some of which have never received parliamentary approval. Even those that received parliamentary approval were not fully implemented (Assadzadeh, 1997: chap. 2). Under perfect targeting, Iran required only 2.0 per cent of GDP to alleviate rural poverty and 2.3 per cent of GDP to alleviate urban poverty in 1993. According to Bakhash (1985), the war with Iran and other war-related activities were absorbing almost one-third of the country's budget during that period. If a country can spend so much on war, it would perhaps not be very hard to spend a small fraction of GDP to initiate effective programmes for poverty alleviation.

9 Summary and conclusions

This chapter has analysed the changes in the extent of poverty in rural and urban sectors between 1983 and 1993. The analysis has been carried out using household-level data from three household income and expenditure surveys conducted during 1983, 1988 and 1993. The first survey relates to a welfare-oriented (pro-poor) policy regime, the second relates to a period when Iran was exhausted by war, and the third relates to a

period dominated by a growth-oriented strategy. The major conclusions that emerge from our analysis may be stated as follows.

During 1983–1988, both sectors experienced a rise in poverty. Specifically, poverty in the urban sector more than doubled in terms of all the poverty indices considered. This was mainly due to the war, economic recession and a drop in oil revenue, which occurred during that period. Had the government not provided a safety net to the poor strata by subsidizing basic needs through widespread rationing, the effect of economic hardship on the poor would have been even worse. In both sectors, the extent of poverty declined during 1988–1993. This may be attributed to the positive impact of economic reform policies initiated by the government during that period.

Over a period of 10 years, the extent of poverty in the rural area declined slightly, whereas in the urban sector it increased by more than 40 per cent. The alarming rate of increase in urban poverty demands greater attention from the government to initiate effective poverty alleviation programmes. The sensitivity analysis shows that all the major patterns and trends in poverty remain unaffected by small changes (10 per cent) in the poverty lines. The dominance tests extend this conclusion to the whole range of permissible poverty lines and poverty measures. The decomposition of changes in poverty over time into growth and redistribution components indicates that in each sector the redistribution component was positive during 1983–1993, implying that the deterioration in income inequality contributed to the worsening of poverty. The growth component, however, affected the two sectors differently. Between 1983 and 1993, the growth component for the rural sector was negative, contributing to the decline in poverty. For the urban sector, it was positive, tending to raise the level of poverty.

There are significant regional differences in the level of poverty in Iran. In the rural sector, the south-eastern region was the poorest of all regions throughout the period. The north-eastern and south-western regions also showed a high incidence of poverty. In the urban sector, the south-eastern region turned out to be one of the poorest regions. The level of poverty also varies considerably across occupations. In the rural sector, poverty was highest among farmers and miscellaneous occupations; farmers contributed more than 65 per cent to poverty during the period of this study. In the urban sector, production workers and the miscellaneous occupations group contributed most to poverty.

By and large, the findings of this study provide a clear picture of changes in poverty and income inequality over a period of 10 years in the post-Islamic era. Most of the temporal changes in poverty seem to be to some extent reflections, if not outcomes, of government policies, strategies and war-related activities. It would be appropriate to say that

political stability accompanied by consistent and sustainable growth development policies could ensure a reduction in poverty in Iran.

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How economic growth reduces poverty: A general equilibrium analysis for Indonesia

George Fane and Peter Warr

1 Introduction

Many studies have examined the relationship between the rate at which poverty declines over time and the rate of growth of real GDP. These studies indicate a strong statistical correlation between these two variables, but find that the quantitative relationship between them varies across countries and over time (for example, World Bank, 2000; Dollar and Kraay, 2002). A frequent criticism of this type of study is that both the growth of real output and poverty reduction are endogenously determined within a general equilibrium framework, and stable relationships between endogenous variables do not generally exist. This type of reasoning has spawned a large literature on the “quality of growth”, which investigates whether the impact that growth has on the poor depends on factors such as which sectors (agriculture, industry or services, for instance) expand (for example, Ravallion and Datt, 1996), as well as on the government’s redistributive policies (for example, Thomas, 2000).

This chapter investigates the determinants of poverty reduction in less developed countries from a different perspective. It focuses on the variables that lie behind the poverty reduction/economic growth correlation by studying the way poverty reduction is linked to the exogenous factors driving the growth of GDP and its composition. The significance of this approach is that it does not assume that the effects these variables have on poverty operate solely through their effects on economic growth.

Consider the reduced-form equation for the percentage increase in GDP:

$$\Delta y = \Delta \mathbf{X} \mathbf{a}, \quad (8.1)$$

where Δ denotes the difference operator, y is the logarithm of GDP, \mathbf{X} is a vector of K exogenous variables and \mathbf{a} is a vector of K reduced-form coefficients. Similarly, the reduced-form equation for the increase in some chosen index of poverty – for example, the headcount rate, p , relative to some given poverty line – can be written as:

$$\Delta p = \Delta \mathbf{X} \boldsymbol{\beta}, \quad (8.2)$$

where $\Delta \mathbf{X}$ is defined above and $\boldsymbol{\beta}$ is again a vector of K coefficients. In this chapter, the “quality of GDP growth” derived from changes in exogenous variable i is defined to be the amount by which one unit of growth derived from exogenous variable i contributes to poverty reduction:

$$\varphi_i = -\beta_i / \alpha_i. \quad (8.3)$$

If the K exogenous variables are numbered so that $\varphi_1 \geq \varphi_2 \geq \varphi_3 \geq \dots \geq \varphi_K$, then variable 1 produces the highest-quality growth, in the sense that a given increase in GDP owing to an increase in variable 1 reduces poverty by more than the same increase in GDP owing to an increase in any other exogenous variable, whereas variable K produces the lowest-quality growth. If the only exogenous variable to change is variable i , the elasticity of poverty with respect to GDP is $-\varphi_i/p$. Estimates of these elasticities are reported below for various exogenous sources of growth. With the signs changed, they are indicators of the “quality” of growth derived from each source.

A stable relationship between increases in GDP and reductions in poverty will exist only under special and implausible assumptions – for example, that $\varphi_i = \varphi$ for all i , or that the exogenous variables always change by the same proportions. If these conditions do not hold, the relationship between poverty reduction and growth in any actual change will depend on the relative importance of “high-quality” and “low-quality” factors in generating the observed change in GDP.

If the poor and the rest of the population owned factors in the same proportions, then changes in factor returns would obviously have no effects on relative incomes and inequality. Whatever the source of growth, each person’s income would rise or fall by the same proportion as each other person’s, and all sources of growth would therefore have the same

quality. In Indonesia, however, unskilled labour makes up a much larger share of the incomes of the poor than of the rest of the population, whereas incomes from skilled labour have the opposite characteristic. Inequality is therefore reduced, and the quality of growth is relatively high, for types of growth that raise the returns to unskilled labour (and other factors that account for a relatively large share of the incomes of the poor) or that reduce the returns to skilled labour (and other factors that are a relatively small share of the incomes of the poor).

2 The WAYANG model

The simulation results reported in this chapter are derived from the WAYANG model of the Indonesian economy (Warr et al., 1998; Wittwer, 1999; Warr and Wittwer, 2003).¹ WAYANG shares many structural features with the ORANI general equilibrium model of the Australian economy (Dixon et al., 1982), although these features have been adapted to match the realities of the Indonesian economy. It assumes competitive profit maximization by firms and competitive utility maximization by consumers.

A major advantage of the WAYANG model for analysing poverty is that it contains 10 broad household groups – seven rural and three urban – that are defined by the occupations of the household head, as summarized in table 8.1. The income of each of these household groups depends on its (exogenous) ownership of factors of production, the (endogenous) rates of return to these factors and any net transfers from elsewhere in the system. Ownership of factors of production for each broad household group is derived from the official 1993 Social Accounting Matrix. Section 3 explains how the broad household groups distinguished by the basic model can be disaggregated to the level of individual households, so that estimates of poverty and inequality for Indonesia can be derived from estimates of the incomes and expenditures of the 10 broad groups and the distribution of income within each broad group.

2.1 *Sectors and commodities*

The model contains 65 producer goods and services produced by 65 corresponding sectors. There are 18 agricultural sectors, 5 resource sectors, 9 agricultural processing sectors, 18 manufacturing sectors and 15 service sectors. These sectors are classified as either “export competing” or “import competing”. Non-traded sectors are classified as import competing, but with arbitrarily low imports in the database of the model, so that the demand equation for the domestic product is independent of the

price of the imported product to an arbitrarily close approximation.² The level of exports of an export-competing sector is treated as being endogenous, whereas the exports of an import-competing sector are set exogenously.³ The criterion used to classify sectors is the ratio of imports to exports.

The 65 composite commodities can be sold to five different types of user: producers, investors, households, the government and the rest of the world. Composite commodities come from two sources: domestic production and imports. The proportions in which users purchase domestically produced and imported producer goods of each kind depend on their relative prices and on Armington elasticities of substitution.⁴

2.2 Production

The model distinguishes four mobile factors: skilled labour, unskilled labour, mobile agricultural capital and mobile non-agricultural capital. It is assumed that mobile agricultural capital is fully mobile across agricultural sectors, but cannot be used outside agriculture. Similarly, mobile non-agricultural capital cannot be used in agriculture but is fully mobile across non-agricultural sectors.

The two types of labour are distinguished by the educational characteristics of the workforce: skilled labour is defined as those workers with lower secondary education, or more. Unskilled labour, which is defined residually, is assumed to be mobile across the entire economy. Since Indonesian labour force data indicate that very few people with more than primary education are employed in agriculture, it is assumed that no skilled labour is employed in agriculture, but that skilled labour is fully mobile across all non-agricultural sectors. These assumptions imply that unskilled wages must be equal in all sectors and that skilled wages must be equal in all non-agricultural sectors. In every sector, it is assumed that there are diminishing returns to scale to mobile factors alone. However, a sector-specific fixed factor is introduced in every sector to ensure that there are constant returns to scale, in the sense that each sector's output would rise by 1 per cent if there were a 1 per cent increase in its usage of all intermediate inputs and all factors, including the specific factor. Supplies of specific factors are varied in some of the simulations described below. The set of specific factors in the agricultural sectors is referred to as "land" and the set of specific factors in the non-agricultural sectors as "fixed capital".

In each non-agricultural sector, skilled and unskilled labour enters a constant elasticity of substitution (CES) production function to produce "effective labour". Effective labour, mobile non-agricultural capital and the sector-specific fixed capital then enter the sector's production

function for domestic output. The structure of production in agricultural sectors is exactly analogous, except that effective labour in agriculture is simply unskilled labour.

Factor demand equations, derived from the CES production functions, relate the demand for each primary factor to sectoral outputs and the prices of each of the primary factors. The assumption of constant returns means that all factor demand functions are homogeneous of degree one in domestic output. In each sector, there is a zero profit condition, which equates the price of domestic output to the minimum unit cost of production. This condition can be thought of as determining the prices of the fixed factors.

The demand for “composite” intermediate inputs by each sector is determined by the Leontief assumption that they are required in fixed proportions to gross output. Composite intermediate inputs are produced under Armington assumptions from domestic and imported intermediate inputs.

2.3 Consumption and labour supply

Household consumption demands for each composite commodity are derived from the linear expenditure system (LES). The composite consumption commodities are produced under Armington assumptions from imported and domestic products. The household supplies of skilled and unskilled labour are assumed to be exogenous.

The LES assumption that each individual household’s spending on each good is a linear function of its income reconciles, on the one hand, the model’s treatment of each of the 10 broad household groups as if it were an individual whose income was equal to the total income of that group with the assumption that, on the other hand, each of the 10 broad household groups actually comprises a large number of individual households. Without the LES assumption, the consumption of each household group would depend on the distribution of individual incomes within that household group, as well as on the average income for that household group.

2.4 Elasticity estimates

The elasticity estimates used in WAYANG for the consumer demand system and the factor demand system were taken from empirical estimates derived econometrically for a similar model of the Thai economy, known as PARA. These parameters were amended to match the differences between the databases for WAYANG and PARA so as to ensure the homogeneity properties required by economic theory. All export

demand elasticities were set equal to minus 20. In the basic runs of the model, the Armington elasticities of substitution between imports and domestically produced goods were set equal to 2 and the constant elasticities of substitution among the primary factors of production were all set equal to unity, as in the Cobb–Douglas case. Section 4 reports tests of the sensitivity of the simulation results to large changes in both these assumptions.

2.5 Closure

The two main closure issues relate to: (a) balancing the government budget, and (b) determining government spending, investment and the current account balance. This chapter uses a “long-run growth closure”: the real value of the government budget balance, real government spending, real investment and the current account balance expressed in foreign currency are all made directly proportional to GDP. This treatment is more appropriate in the context of simulations that compare the distributional effects of various sources of long-run growth than the conventional “welfare closure” in which the real values of these variables are assumed to remain constant. If government spending, investment and the current account balance were held constant, factor accumulation and technical progress would have to be used purely to generate additional consumption, and in some cases this would require large changes in factor and product prices.

The income tax rate is endogenously adjusted to balance the government’s budget. Experiments that allowed the rate of value added tax to adjust endogenously indicated that the results are not sensitive to the choice between these alternative closures.⁵

3 Measuring and modelling poverty and inequality

This section explains the way changes in poverty and inequality, at the level of individual households, are estimated from changes in income and expenditure for broad household groups. The measures of Indonesian poverty and inequality used here are based on household expenditure because this is how the official Indonesian data on poverty are derived. However, since consumption is assumed to be directly proportional to after-tax income, the choice between income- and expenditure-based poverty measures is unimportant.

The Gini coefficient is used to measure inequality. Two familiar measures of poverty are reported: the “headcount” rate, defined as the proportion of the population below the poverty line, and the “poverty gap”,

defined as the proportion of total national consumption that would just suffice (if provided by an external donor at unchanged prices and given other sources and uses of income) to raise the consumption of those below the poverty line to the poverty line.

It is assumed that, whereas households belonging to different groups may own factors in different proportions, those belonging to any one group all own the various factors of production in the same proportions:

$$F_k^{h,j} = \theta^{h,j} \cdot F_k^h, \quad \text{for all } h, j \text{ and } k, \quad (8.4)$$

where $F_k^{h,j}$ is the amount of factor k owned by individual household j in household group h and F_k^h is the arithmetic mean over j of $F_k^{h,j}$ for all households in group h . Taking the arithmetic means of both sides of equation (8.4) shows that the arithmetic mean of $\theta^{h,j}$ over j for all households in group h is unity.

Let w_k be the price of factor k and assume that the total expenditure of each individual household in household group h is a fraction γ_h of pre-tax income:

$$E^{h,j} = \gamma_h \cdot \sum_k w_k \theta^{h,j} F_k^h = \theta^{h,j} \gamma_h \cdot \sum_k w_k F_k^h = \theta^{h,j} E^h. \quad (8.5)$$

The first equality in (8.5) is definitional. The second follows trivially from the first, and the third can be derived from taking the arithmetic means of the first two and recalling that E^h is the arithmetic mean of $E^{h,j}$ over j and that the arithmetic mean of $\theta^{h,j}$ over j is unity.

For each broad household group h , $\log_e \theta^{h,j}$ is assumed to be normally distributed over j with mean μ_h and standard deviation σ_h . In practice, as explained in note 6, only two separate values of σ_h were used, rather than 10, because one common value of the standard deviation was imposed on all rural groups and another on all urban groups. Equation (8.5) shows that, although factor prices affect the mean of the logarithm of individual household expenditures, they do not affect the standard deviation of the logarithm of individual household expenditures. It is therefore appropriate to assume that σ_h remains constant throughout all the simulations. From the assumption of lognormality, it follows that:⁶

$$\mu_h = \log_e[AM_j(\theta^{h,j})] - 0.5\sigma_h^2 = -0.5\sigma_h^2, \quad (8.6)$$

where $AM_j(\theta^{h,j})$ is the arithmetic mean over j of $\theta^{h,j}$. Since this mean is unity, its logarithm is zero. The parameter σ_h was estimated separately for urban and rural households by searching for the values that replicate official estimates of the national headcount poverty rate and Gini

coefficient.⁷ Equation (8.6) makes it possible to derive μ_h from σ_h . Since the values of E^h before and after various shocks are given by the WAY-ANG model, equation (8.5) can be used to derive the distributions of individual household expenditures within each of the 10 broad groups. It is then straightforward to estimate how the shocks affect poverty and inequality at the national level.⁸

Table 8.1 summarizes the basic data on household expenditure, poverty incidence and inequality. The seven rural households account for 73 per cent of the total population but only 61 per cent of total consumption

Table 8.1 Expenditure and poverty incidence by household group

Household group defined by location (rural or urban) and occupation of household head	Percentage of total population in this group	Mean per capita expenditure (1993 Rp '000/year)	Percentage of this group in poverty	Percentage of all poor people in this group
Rural 1. Landless agricultural labourers	10.0	456	38.9	28.9
Rural 2. Farmers owning less than 0.5 ha.	27.3	625	15.1	30.9
Rural 3. Farmers owning 0.5 to 1.0 ha.	6.2	687	10.5	4.9
Rural 4. Farmers owning more than 1.0 ha.	6.4	1,011	1.5	0.7
Rural 5. Non-agricultural, not in labour force	8.8	610	16.5	10.9
Rural 6. Non-agricultural, low-income occupations	1.5	1,219	0.5	0.1
Rural 7. Non-agricultural, high-income occupations	13.0	1,268	0.3	0.3
Urban 1. Not in the labour force	12.4	789	21.3	19.7
Urban 2. Low-income occupations	2.6	916	15.4	2.9
Urban 3. High-income occupations	11.8	2,336	0.8	0.7
Indonesia	100.0	957	13.4	100.0
<i>Memo items:</i>				
Poverty line (1993 Rp '000 per year)			369.5	
Headcount poverty rate (per cent)			13.4	
Poverty gap (per cent)			1.1	
Gini coefficient (per cent)			39.6	

Source: Database of WAYANG model.

expenditure. The four poorest household groups, measured in terms of average expenditure, are all rural. However, because it is assumed that factor ownership, and hence expenditure, is lognormally distributed within each household group, it follows that some members of each group are below the poverty line, and in fact poverty incidence is higher in the poorest urban household than in all but one of the rural households. Nevertheless, poverty is mainly a rural phenomenon: 77 per cent of all poor households in Indonesia are rural.

Table 8.2 shows the proportions in which each household group derives income from the ownership of various factors as a proportion of its net income after all transfers and after payment of income tax. Unskilled labour is the single most important income source for the four poorest rural household groups (that is rural 1, 2, 3 and 5), which together account for 76 per cent of total poverty. Land is an important income source for rural household groups 2 and 3, which together account for over a third of all poverty. Capital that is mobile within the agricultural sector is a relatively minor source of income for all households, but its ownership is heavily concentrated in the poorest households. Unskilled labour, mobile agricultural capital and land are the factors with the greatest relative importance for the poor, whereas for the non-poor the corresponding factor is skilled labour. Fixed capital and mobile non-agricultural capital are slightly more important sources of income for the non-poor than for the poor.

4 The simulations

4.1 *The shocks*

Table 8.3 reports the effects of Hicks-neutral productivity increases in various broad sectors. The results are reported as the “elasticity” with respect to GDP of the variables listed in the row headings. Since GDP is endogenous, this elasticity is the ratio of the percentage change in the variable to the percentage change in GDP in the simulation indicated in the column heading.

Table 8.4 reports the effects of increases in the supplies of seven groups of factors. Because aggregate factor supplies are defined to be the sum across households of household factor endowments, these simulations correspond to exogenous increases in household factor endowments. The identity between the effects of shocks TFP1 and F1 provides a computational check on the model: the uniform increase in productivity in all sectors needed to raise GDP by 1 per cent is equivalent to the uniform increase in all factor supplies needed to raise GDP by 1 per cent.

Table 8.2 Factor ownership of the broad household groups

Household group	Shares in household income (per cent)					
	Unskilled labour	Skilled labour	Mobile capital	Mobile agriculture	Mobile non-agriculture capital	Fixed capital
Rural 1	83.7	1.9	3.5		5.1	3.3
Rural 2	40.4	5.5	2.3		11.0	29.6
Rural 3	49.7	4.9	1.5		8.0	27.0
Rural 4	56.7	5.8	0.9		6.9	16.4
Rural 5	25.0	22.7	1.2		8.8	20.8
Rural 6	12.2	5.6	2.9		21.6	51.1
Rural 7	38.7	34.0	1.1		9.1	24.2
Urban 1	10.4	22.2	2.0		16.3	53.3
Urban 2	17.0	15.0	2.2		18.3	47.7
Urban 3	13.2	38.3	1.3		10.8	38.2
All poor households	45.0	10.2	2.4		10.0	26.1
All households	27.8	24.6	1.6		11.0	33.4
Ratio, poor households to all	1.62	0.41	1.50		0.92	0.78
						1.45

Source: Poverty submodel estimates and database of WAYANG model.

Notes: For each household group, the shares do not add to 100 per cent because, in addition to the listed factors, households also pay out, or receive, net transfers from other households, the government and the rest of the world. The proportions for all poor households are obtained by weighting the proportions for each household group by the table 8.1 estimates of the proportion of all poor people who are in that group.

Tables 8.3 and 8.4 confirm that balanced increases in supply (TFP1, F1) have very little effect on inequality, as measured by the Gini coefficient. What little effect there is comes from changes in the structure of demand as real incomes rise. However, when factor accumulation or technical change is not uniform, inequality sometimes rises and sometimes falls substantially, and there are correspondingly wide differences in the estimated qualities of growth resulting from different sources. Nevertheless – in common with the results found by Dollar and Kraay (2002) using actual data for developing countries – “growth is good for the poor” in all the simulations described here.

Tables 8.3 and 8.4 are consistent with the proposition noted earlier: when growth is associated with a rise in the returns to factors owned intensively by the poor, relative to the non-poor, it is associated with a fall in inequality. Agriculture is the exclusive user of two factors that are relatively important sources of income for the poor – land and mobile agricultural capital. Technical progress in agriculture releases these factors and drives down their prices. Agriculture is also a relatively intensive user of unskilled labour, but does not use skilled labour. Technical progress in agriculture therefore raises the wage of skilled labour relative to that of unskilled labour. For these reasons, technical progress in agriculture raises inequality and provides relatively small benefits to the poor. The agricultural sector is dominated by food crops, of which by far the most important is rice. In these sectors, exports are exogenous and imports are low or zero. As a result, most of any increase in output owing to technical progress must be consumed domestically. For these reasons, a 1 per cent increase in GDP owing to technical progress in agriculture (TFP6) raises the Gini coefficient by more, and reduces poverty by less, than the same amount of growth produced by technical progress in any other broad sector.

Services are at the opposite extreme to agriculture: a 1 per cent increase in GDP owing to technical progress in services (TFP2) reduces the Gini coefficient and both poverty measures by more than the same amount of growth induced by technical progress in any other broad sector. Because the service sector is a relatively intensive user of skilled labour, technical progress in services releases skilled labour and drives down its price. Because skilled labour is a relatively unimportant source of income for the poor, a 1 per cent rise in GDP that involves a substantial fall in the wages of skilled labour tends to reduce inequality.

In the case of the factor accumulation simulations, the most extreme divergence is between a 1 per cent rise in GDP owing to the accumulation of skilled labour (F2) – which reduces the Gini coefficient, the headcount poverty rate and the poverty gap by 1.1 per cent, 7.7 per cent and 10.1 per cent, respectively – and the same growth owing to the

Table 8.3 Elasticities with respect to GDP derived from Hicks-neutral technical progress in broad economic sectors

Variable	Shock ^a					
	TFP1	TFP2	TFP3	TFP4	TFP5	TFP6
All sectors						
Headcount poverty	-4.33	-5.91	-3.51	-3.31	-2.90	-1.46
Poverty gap	-6.40	-8.16	-5.93	-5.44	-4.85	-3.49
Gini coefficient	-0.03	-0.55	0.41	0.23	0.36	0.97
Skilled wages ^b	0.90	-1.64	3.57	1.80	3.99	4.96
Unskilled wages ^b	1.01	1.54	0.38	0.36	0.63	0.58
Land rent, agriculture ^b	1.40	2.68	1.18	0.88	4.14	-4.14
Rent, mobile capital, agriculture ^b	1.31	2.60	1.07	0.86	3.36	-3.96
Rent, fixed capital, non-agriculture ^b	0.83	0.59	0.17	0.80	0.73	2.59
Rent, mobile capital, non-agriculture ^b	0.82	1.27	-0.57	-0.40	-0.21	2.57

Source: WAYANG model estimates.

Notes:

a. The magnitude of each shock (e.g. Hicks-neutral technical progress in manufacturing, with all other exogenous variables held constant) is endogenously determined to produce an increase in GDP of 1 per cent. The elasticities reported in the table are the resulting percentage changes in the variables indicated.

b. The estimates reported are the elasticities of the real returns to the indicated factors, using the CPI to deflate changes in nominal factor prices. In these simulations, all factor supplies are constant.

Table 8.4 Elasticities with respect to GDP derived from accumulation of factors of production

Variable	Shock ^a						
	F1	F2	F3	F4	F5	F6	F7
	All factors	Skilled labour	Unskilled labour	Land	Mobile capital, agriculture	Fixed capital, non-agriculture	Mobile capital, non-agriculture
Headcount poverty	-4.33	-7.65	-2.51	-1.46	-1.61	-4.41	-3.63
Poverty gap	-6.40	-10.12	-4.56	-3.50	-3.67	-6.52	-5.90
Gini coefficient	-0.03	-1.11	0.63	0.97	0.92	-0.06	0.21
Skilled wages ^b	0.90	-4.46	4.00	4.94	4.85	0.89	2.48
Unskilled wages ^b	1.01	2.70	-0.34	0.59	0.69	1.05	0.52
Land rents, agriculture ^b	1.40	3.11	0.26	-4.16	-3.70	2.11	1.94
Rent, mobile capital, agriculture ^b	1.31	3.00	0.24	-3.92	-5.56	1.96	1.80
Rent, fixed capital, non-agriculture ^b	0.83	0.45	1.12	2.60	2.48	0.60	0.45
Rent, mobile capital, non-agriculture ^b	0.82	1.47	0.62	2.57	2.49	0.46	-0.27

Source: WAYANG model estimates.

Notes:

a. The magnitude of each shock (e.g. an increase in the supply of unskilled labour, with the population and all other exogenous variables held constant) is endogenously determined to produce an increase in GDP of 1 per cent. The elasticities reported in the table are the percentage changes in the variables indicated.

b. The estimates reported are the elasticities with respect to GDP of the total real earnings of the factors indicated, using the CPI to deflate changes in nominal factor prices and including any changes in factor supplies.

accumulation of land (F4) – which raises the Gini coefficient by 1.0 per cent and reduces the headcount rate by 1.5 per cent and the poverty gap by 3.5 per cent. The explanation for these results is that the accumulation of skilled labour raises the wages of unskilled labour and reduces the wages of skilled labour itself, whereas the accumulation of land has a relatively large positive effect on skilled wages and relatively little effect on unskilled wages.

Factor accumulation depresses the real return to the factor being accumulated and raises the returns to other factors. Table 8.4 shows that, with one exception, these price effects outweigh the quantity effects: the accumulation of any one factor generally reduces the total real earnings of that factor. The one exception to this generalization is fixed capital outside the agricultural sector. As a result, the accumulation of factors that are relatively more important income sources for the poor than for the non-poor – such as unskilled labour, mobile agricultural capital and land – raises inequality and provides relatively small benefits to the poor, whereas the accumulation of skilled labour, which is the relatively least important source of income for the poor, reduces inequality and produces high-quality growth.

4.2 Sensitivity analysis

A sensitivity analysis was conducted by raising the elasticity of substitution among the primary factors from 1 to 2 and the Armington elasticities of substitution between domestic and imported commodities from 2 to 10. In table 8.5, the top rows for each variable reproduce the results in table 8.3, and the bottom rows for each show the new results implied by the higher elasticities.

Under the elasticity assumptions on which table 8.3 is based, 1 per cent GDP growth is more effective in reducing poverty (as measured by either the headcount ratio or the poverty gap) if it is the result of technical progress in services than if it is owing to technical progress in any other sector. In second place is technical progress in manufacturing, followed by natural resources, agricultural processing and, in last place, agriculture. Almost the same ordering of sectors also applies to reductions in inequality. Table 8.5 shows that all these results are robust with respect to the large increases in elasticities of substitution among factors and commodities that are analysed here.

Although assuming higher elasticities of substitution does not alter the ordering of sectors by quality of growth, it does substantially reduce the disparities among sectors. For sectors in which technical progress sufficient to raise GDP by 1 per cent reduces poverty (on either measure) by more than the uniform economy-wide technical progress that produces

Table 8.5 Sensitivity analysis: Elasticities with respect to GDP derived from Hicks-neutral technical progress in broad economic sectors under alternative parameter assumptions

Variable ^a	Elasticities		Shock					
			TFP			TFP		
	σ	Arm	All sectors	Services	Manufacturing	Natural resources	Agriculture processing	Agriculture
Headcount poverty	1	2	-4.33	-5.91	-3.51	-3.31	-2.90	-1.46
	2	10	-4.29	-5.42	-3.70	-3.44	-3.19	-2.55
Poverty gap	1	2	-6.40	-8.16	-5.93	-5.44	-4.85	-3.49
	2	10	-6.37	-7.67	-6.24	-5.52	-5.20	-4.70
Gini coefficient	1	2	-0.03	-0.55	0.41	0.23	0.36	0.97
	2	10	-0.01	-0.35	0.41	0.10	0.21	0.57
Skilled wages ^b	1	2	0.90	-1.64	3.57	1.80	3.99	4.96
	2	10	0.93	-0.71	3.10	1.04	2.76	3.68
Unskilled wages ^b	1	2	1.01	1.54	0.38	0.36	0.63	0.58
	2	10	1.03	1.37	0.25	0.70	0.96	0.98
Land rent, agriculture ^b	1	2	1.40	2.68	1.18	0.88	4.14	-4.14
	2	10	1.23	1.84	0.53	0.58	2.96	-0.59
Rent, mobile capital, agriculture ^b	1	2	1.31	2.60	1.07	0.86	3.36	-3.96
	2	10	1.18	1.77	0.44	0.56	2.48	-0.29
Rent, fixed capital, non-agriculture ^b	1	2	0.83	0.59	0.17	0.80	0.73	2.59
	2	10	0.92	0.65	0.68	1.01	1.05	2.05
Rent, mobile capital, non-agriculture ^b	1	2	0.82	1.27	-0.57	-0.40	-0.21	2.57
	2	10	0.92	1.05	0.52	0.09	0.59	1.99

Source: WYANG model estimates.

Notes:

a. For each variable, the elasticity estimates in the first row for each variable are those given in table 8.3 and are derived on the assumption that $\sigma = 1$ and $Arm = 2$, where σ is the elasticity of substitution among primary and intermediate inputs and Arm is the Armington elasticity of substitution between domestic and imported goods. The estimates in the second row for each variable are derived on the alternative assumption that $\sigma = 2$ and $Arm = 10$.

b. The estimates reported are the elasticities of the real returns to the indicated factors, using the CPI to deflate changes in nominal factor prices. In these simulations, all factor supplies are constant.

the same total growth, the reduction in poverty is less under the high-elasticity assumptions than under the low-elasticity assumptions. Similarly, for sectors in which technical progress sufficient to raise GDP by 1 per cent reduces poverty by less than the uniform economy-wide technical progress that produces the same total growth, the reduction in poverty is more under the high-elasticity assumptions than under the low-elasticity assumptions. Table 8.5 also shows that an exactly analogous result holds for the relative effects of sectoral technical progress on inequality.

The explanation for all the results summarized in the preceding paragraph is that the higher the elasticities of substitution among goods and factors, the smaller (in absolute terms) are the changes in relative factor prices needed to restore equilibrium in response to technical progress in any one sector. The smaller the changes in relative factor prices, the more equally (in proportionate terms) is any given increase in GDP shared among all households.

5 Conclusion

The results and methodology reported here suggest that large oversimplifications are involved in relating poverty reduction directly to GDP growth without distinguishing among different possible sources of growth. Contrary to the assumptions of many commentators, the poor do much better if a given amount of GDP growth is produced by technical progress in services or in manufacturing than if it is owing to technical progress in agriculture. Although more work needs to be done to improve on the parameter values assumed in this study, these qualitative results are robust with respect to wide variations in assumptions about elasticities of substitution among goods and factors.

The results also imply that growth in broad sectors – agriculture, manufacturing, services, etc. – will be associated with very different effects on poverty and inequality depending on whether the exogenous shocks affect demand or supply. For example, an increase in the supply of factors used intensively in agriculture depresses the real returns to these factors while raising agricultural output; whereas an increase in demand for agricultural products, perhaps owing to policy changes, would raise both agricultural output and the real returns to the factors used intensively in agriculture.

Another important implication of the results found here is that providing the poor with free education – modelled as the conversion of unskilled labour into skilled labour – is a doubly effective way of reducing

poverty: besides the obvious direct effects on the incomes of those receiving education, the increase in the supply of skilled labour and the reduction in the supply of unskilled labour both help to reduce poverty by raising the wage bill of the remaining unskilled workers.

Notes

This chapter has benefited from extensive discussions with Glyn Wittwer. We are also grateful for helpful comments from an anonymous referee. All remaining mistakes are our own.

1. Wittwer (1999) describes the technical features of the full model in detail.
2. In the case of sectors in which imports are recorded as zero in the source data, they are set at an arbitrarily low, but positive, level in the database of the model. This keeps them at zero to a very close approximation.
3. Given that the exported good and domestically sold good are treated as being identical, this assumption is necessary to make it possible to separate the domestic price of the import-competing good from the price of the exported good. Otherwise, the Armington structure described above would be redundant.
4. Following Armington (1969), the commodity “textiles” in each household utility function is assumed to be “produced” by households from imported textiles and domestically produced textiles according to a CES production function. Similar assumptions are also made for the other 64 commodities, and for the usage of each commodity as an intermediate input, as an investment good and by the government. The “Armington elasticities” are the elasticities of substitution between the imported and domestically produced commodities.
5. The reason is that large endogenous changes in tax rates are never needed, because the long-run growth closure constrains government expenditure to be exactly proportional to GDP and the main revenue items turn out to be nearly proportional to GDP at fixed tax rates.
6. The first equality in (8.6) is an application of a well-known property of the lognormal distribution. See Aitchison and Brown (1957).
7. A spreadsheet was used to approximate the lognormal distribution by dividing households in each broad group into over 200 subgroups defined in terms of narrow expenditure bands. Initially, arbitrary values of the rural and urban standard deviations, σ_h , were imposed and the proportion of households in each broad group within each narrow expenditure band was estimated, using equation (8.6) to derive σ_h for each broad group from the imposed value of σ_h and the database values of the actual arithmetic mean of household expenditure for the broad group. Given the estimated proportions of each household group in each narrow expenditure band, it was straightforward to derive the implied values of the national headcount poverty rate and the Gini coefficient. A search was then conducted over the values of the rural and urban standard deviations to find the ones that reproduced the actual national headcount poverty rate and Gini coefficient.
8. Using the same spreadsheet approach and the same estimated standard deviations described in note 7, it was straightforward to estimate the changes in the headcount poverty rate, the poverty gap and the Gini coefficient due to changes in the arithmetic means of the real expenditures of each household group that were implied by the WAYANG simulation results for each shock analysed.

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Poverty, inequality and growth in Zambia during the 1990s

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1 Introduction

Since the election of the Movement for Multiparty Democracy (MMD) government in 1991, the Zambian authorities have implemented sweeping economic reforms. In addition to undertaking a sharp stabilization programme early in the decade, the government has implemented reforms in agricultural marketing, a large privatization programme, sweeping trade policy reforms and, more recently, public sector reform. After providing a brief overview of Zambia's economic performance since independence, this chapter analyses the 1991, 1996 and 1998 household survey data in order to chart the evolution of poverty and inequality during the 1990s. In addition, the economic policies pursued during the 1990s are described in detail, enabling linkages to be drawn between the policies implemented and the observed changes in poverty and inequality.

2 Economic performance, 1964–1991

At independence in 1964, Zambia was one of the most prosperous countries in sub-Saharan Africa (SSA).¹ Having substantial agricultural and mineral natural resources, the prospects for growth and human development seemed bright. However, poverty was extremely high and the new

government faced a major challenge to redress the large inequalities in the distribution of income.² Initially Zambia followed fairly liberal political and economic policies, with efforts focused on the provision of infrastructure and services for the bulk of the population. However, the Mulungushi Declaration in 1968 and its implementation in 1972 marked a change towards a more restrictive policy environment involving a heavy role for the state in national development. These policies included a much more inward-looking approach to development: manufacturing was protected by high tariffs and an overvalued exchange rate encouraged inefficient capital-intensive development for the domestic market. Price controls for major commodities were introduced and credit was directed by the national commercial bank. In addition, the government took direct control over many parts of the manufacturing, agricultural marketing and mining sectors.

During the first 10 years after independence, rising copper prices and high levels of investment resulted in economic growth averaging 2.4 per cent a year. However, this was still below the rate of population growth, resulting in falling per capita incomes. The large gap between average urban and rural incomes resulted in an overall Gini coefficient of 0.59 in 1974, suggesting that inequality increased during the first 10 years.

After 1975 Zambia faced a collapsing copper price, conflict in neighbouring countries and the severe repercussions of the first oil shock. Initially the collapse in the copper price was seen by the government (and the international community) as temporary. The government therefore borrowed to maintain levels of consumption. However, by the early 1980s, it was apparent that the somewhat half-hearted attempts at reform during the 1970s had not been effective. A more serious IMF/World Bank structural adjustment programme was attempted between 1983 and 1985 with strong conditions attached. The government abandoned this agreement and re-imposed numerous controls in May 1987 after political discontent resulted in food riots in the Copperbelt at the end of 1986.

However, as the economy continued to decline the government had little option but to enter into fresh negotiations with the IMF. In June 1989 it decontrolled all consumer goods prices except maize, and the following year, under a new IMF programme, the government increased the prices of high-grade maize meal by over 100 per cent. This led to widespread rioting in Lusaka and the major Copperbelt towns (Simutanyi, 1996). Normal relations with the World Bank were resumed in March 1991 and the IMF's Rights Accumulation Programme commenced the following month. This in effect enabled Zambia to reschedule its debts to the IMF.³ However, the government's agreement to hold elections in 1991 undermined its commitment to implement painful reforms. The IMF therefore suspended all financial disbursements and inflation rose sharply

as the government printed money to fund civil service pay increases and the election campaign (Simutanyi, 1996).

3 Economic policy reform since 1991

In October 1991 the MMD government was elected on a platform of major reforms. It was faced with a particularly poor macroeconomic environment and the first two years were preoccupied with implementing stabilization measures. In addition, the government attempted to implement far-reaching structural changes to the economy. Many of these structural reforms were intended to open up the economy to the outside world. Others were directed at “internal liberalization” through the removal of many subsidies, including the maize meal and fertilizer subsidies, and the decontrol of agricultural prices. A third set of reforms was focused upon institutional restructuring, notably the commercialization and privatization of many parastatals.

3.1 Macroeconomic stabilization

When the MMD government took power in 1991, GDP was around two-thirds of the level of the late 1960s. Inflation was over 90 per cent and the government budget deficit was 7.3 per cent of GDP. External debt stood at US\$6.8 billion and scheduled debt service was 61 per cent of export earnings (IMF, 1999). The conditionality attached to the IMF's Rights Accumulation Programme specified (i) ceilings on reserve money and domestic credit creation; (ii) various financial indicators, including reduction in debt arrears; and (iii) policy changes to liberalize the foreign exchange and credit markets (White and Edstrand, 1998). Zambia made large strides towards achieving these objectives, particularly in the liberalization of foreign exchange. However, compliance with the IMF conditions slipped, principally because monetary targets were exceeded. High wage settlements for public servants and large unbudgeted transfers to Zambia Airways contributed to Zambia's growing deficits. This was compounded by the effect of a severe drought in 1992. In an effort to counter the inflationary implications of high domestic credit expansion, borrowing and lending rates were decontrolled in October 1992 and the treasury bill was introduced as a less inflationary form of deficit financing (RofZ, 1993a).

Yet by the end of 1992 inflation stood at 191 per cent. In January 1993, therefore, the government introduced a “cash-budgeting system”. This, combined with the liberalization of commercial banking loan rates, an increase in the reserve ratio and the active issue of treasury bills, was

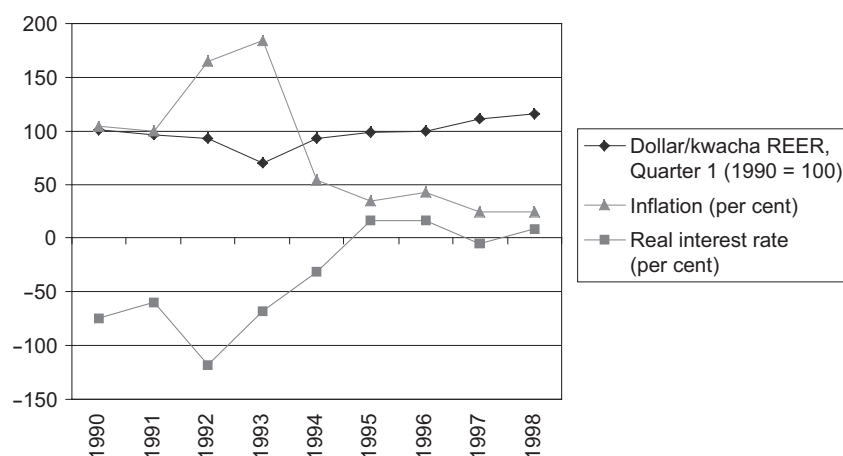


Figure 9.1 Inflation, the real effective exchange rate and real interest rates over the 1990s

successful in reducing inflation to 55 per cent in 1994. Real interest rates rose dramatically, with the annualized yield on 91-day treasury bills reaching almost 200 per cent in July 1993. As inflation fell from 1994 onwards, so did interest rates, but moderate positive real interest rates prevailed. Continued tight monetary policy over the latter half of the 1990s reduced inflation to around 25 per cent in 1998. Figure 9.1 shows inflation, the real effective exchange rate (REER) and the real interest rate for treasury bills over the 1990s.

This drastic stabilization was not without cost: the high returns from government debt caused switching to the purchase of treasury bills, severely curtailing credit to the private sector, and the high real interest rates hurt investment (World Bank, 1994a). Furthermore, the sequencing and timing of the stabilization measures and the continuation of the cash budget have been heavily criticized.⁴

3.2 External liberalization

Closely linked to the macroeconomic stabilization was a set of measures designed to increase Zambia's openness to the rest of the world. Three measures were of particular importance: exchange rate liberalization; trade liberalization; and capital account liberalization.

Prior to 1991, Zambia's exchange rate had been primarily determined by the government. However, one of the conditions attached to IMF support was the liberalization of the exchange rate. Consequently,

foreign exchange was initially provided through the introduction of a “bureau de change” market. The 1992 budget presented a policy of rapid depreciation (Andersson, 1995), which, when combined with negative real interest rates, resulted in a depreciation of the real effective exchange rate. By March 1993, most foreign exchange controls on current transactions had been removed. However, the introduction of positive real interest rates in mid-1993 (owing to the credit market liberalization and the issue of treasury bills described above) resulted in a substantial short-run appreciation of the kwacha as investors switched their money out of foreign currency back into kwacha to exploit the high real interest rates. Furthermore, the maintenance of relatively tight monetary policy since then has resulted in a steady appreciation of the REER.

The MMD government embarked upon a radical programme of trade and industrial policy reform in 1992. Over a five-year period, all licensing and quantitative restrictions on imports and exports were eliminated. In addition to undertaking radical trade liberalization, in February 1994 the Zambian government also liberalized the capital account of the foreign payments systems (Andersson, 1995). However, evidence from the balance of payments suggests that this liberalization has been relatively successful. From 1990 until 1993 net private capital outflows from the economy averaged over US\$150 million per year. After the liberalization, net private capital flows reversed, with an inflow of US\$85 million in 1994. This reversal may have resulted from the government's tight monetary policy and the very high yields available on treasury bonds. However, net private inflows continued to average US\$81 million between 1994 and 1998, reflecting the maintenance of positive real interest rates throughout this period.

3.3 Agricultural marketing reform

In the early 1990s, Zambia was characterized by extreme inflexibility and rigidities in its domestic economy. Nowhere were these distortions and constraints more visible than in the area of agricultural marketing. After independence, the government committed itself to a policy of self-sufficiency in maize production and attempted to achieve this through official price controls and the centralized delivery of credit, input supply, extension and marketing through the National Agricultural Marketing Board (NAMBOARD). A policy of pan-territorial and pan-seasonal pricing was adopted, along with subsidies for fertilizer and transport, which encouraged maize production in remoter regions away from the rail network. In order to maintain low prices for urban consumers, the government provided extensive subsidies (13.7 per cent of the government budget in 1990). Policies distorted the allocation of resources away

from crops in which Zambia has a comparative advantage and created a growing and unsustainable burden upon the government budget. In addition, these policy distortions ensured that maize was Zambia's principal crop⁵ and heavily biased rural production in favour of maize, despite its poorer drought resistance compared with other staple crops. This had important implications for long-term food security.

Reforms to the agricultural marketing system began in 1989 with the abolition of NAMBOARD and the de-monopolization in 1990 of agricultural marketing. The MMD government accelerated reforms by removing the mealie meal and fertilizer subsidies in 1992. Further reforms were implemented in 1993: the decontrol of maize producer prices and the elimination of maize transport subsidies (World Bank, 1996).

In 1993, the government also attempted to reform the maize marketing system by engaging government-supported lending institutions in maize marketing. However, the manner in which this was implemented discouraged entry to the market by private traders, who preferred to invest in high-yielding treasury bills. As a consequence, the government launched the Agricultural Credit Management Programme in November 1994 as a transitory arrangement for the provision of credit for fertilizer and seed as well as a way of strengthening the capacity of private traders to act as financial intermediaries (Copestake, 1998). Furthermore, in 1995 the government refrained from setting a floor price for maize and leased more than half of its storage warehouses to private traders. In addition, the milling industry was privatized, which resulted in the growth of small-scale labour-intensive hammermills.⁶ This, together with the removal of the subsidy and the monopolistic protection of large mills, helped to lower the consumer price of mealie meal and lowered marketing and processing margins (Jayne et al., 1996a; World Bank, 1994b).

The removal of subsidies and the liberalization of agricultural marketing appear to have shifted crop choice to reflect Zambia's comparative advantage better (Keyser, 1996) and led to strong (although sometimes short-lived) growth in some sectors (for example, groundnuts and cotton). However, rural smallholders report increasing difficulty in obtaining access to credit and inputs and in transporting their goods to market (Drinkwater et al., 1996; Francis et al., 1997; Oxfam and IDS, 1999). Furthermore, the failure of the private sector to fill the gaps left by public sector provision of credit and marketing services has resulted in the government's continuing involvement in the provision of inputs, particularly fertilizer (RofZ, 1999a).⁷

3.4 Institutional reform

Between 1968 and 1976, the Zambian government created a large number of parastatal enterprises. The Zambia Industrial and Mining

Corporation (ZIMCO) became a holding company for Zambia Consolidated Copper Mines (ZCCM) and the Industrial Development Corporation (INDECO), which accumulated a large number of subsidiaries. Together they produced more than three-quarters of Zambia's GDP in 1991 (Chanthunya and Murinde, 1998).

A Privatization Act was passed in June 1993 and the Zambia Privatization Agency was formed to implement the privatization process (Chiwele and Chinganya, 1997). Progress was initially slow, with only 15 parastatals sold by mid-1995. However, the process accelerated with the dissolution of ZIMCO in March 1995 and, by 1997, 224 companies had been sold out of a total of 275 offered for sale (Rakner, van de Walle and Mulaisho, 1999). However, political opposition to privatization of the mines delayed the sale of ZCCM. As a consequence, donors withheld payments for three years running. In 2000, the Zambian government finally accepted a bid by the Anglo American Corporation (although Anglo American has recently indicated that it intends to withdraw from its copper investments in Zambia; Lamont, 2002). Table 9.1 summarizes the key policy reforms introduced over the 1990s, along with the external shocks that affected the economy.

4 The impact of reform

The reforms described above had a large impact upon the Zambian economy. This section examines growth, employment and earnings in both the formal and informal sectors and explores the trends in poverty and inequality over the decade.

4.1 Growth, employment and earnings

Although the intention of the reforms was to stimulate growth, Zambian economic performance in the 1990s was disappointing. The economy was extremely vulnerable to external events, notably poor weather and the continued decline in the international price of copper. Total exports (f.o.b.) fell by over 30 per cent between 1990 and 1998, principally owing to a collapse in metal exports by almost half over this period. Copper, Zambia's largest and most important export, collapsed in value from over US\$1 billion in 1990 to US\$431 million in 1998. The volume of copper exports fell by 42 per cent in the face of a continuing downward trend in copper prices – prices in 1998 were more than 30 per cent below those at the start of the decade.⁸

The disastrous performance of the mining and quarrying sector led to declines in GDP in most years between 1990 and 1995. In addition, the severe drought of 1992 resulted in a collapse of agricultural value added

Table 9.1 Major policy reforms and external events, 1989–1998

Year	Stabilization policy and key events	Agricultural price and marketing reforms	Trade reform	Parastatal reform and privatization
1989	Decontrol of all consumer prices (except maize)	Abolition of NAMBOARD		
1990	Policy Framework Paper agreed with IMF	De-monopolization of agricultural marketing Maize meal subsidy withdrawn, leading to food riots		
1991	Normal relations resumed with the IMF Rights Accumulation Programme started IMF suspended disbursements in June – inflation soared Election of MMD government in October on a platform of major reform		Removal of most export controls Removal of the ban on maize exports	
1992	Introduction of treasury bill financing Decontrol of borrowing and lending rates Introduction of “bureau de change” for exchange rate determination	Severe drought	Simplification and compression of tariff rates	
1993	Introduction of cash budgeting	Removal of mealie meal subsidy Removal of fertilizer subsidy Failed attempt to reform agricultural marketing	Increase in the tariff preference for goods from COMESA	Privatization Act passed Zambia Privatization Agency formed

1994	Liberalization of the capital account	Launch of the Agricultural Credit Management Programme		
1995		Further drought Privatization of the milling industry Launch of World Bank Agricultural Sector Investment Programme	Removal of 20 per cent uplift factor applied to import values	Dissolution of ZIMCO
1996	MMD won elections; but United National Independence Party boycotted elections			Acceleration of privatization programme
1997	Donors withdrew balance-of-payments support			
1998	Donors withdrew balance-of-payments support Copper price adversely affected by East Asian crisis	Drought in south and excessive rain in the north caused by El Nino		Negotiations on ZCCM sale fell through (the sale to Anglo American was finally agreed in 2000; but the company indicated in January 2002 that it would withdraw from its investments)

Source: Compiled by McCulloch.

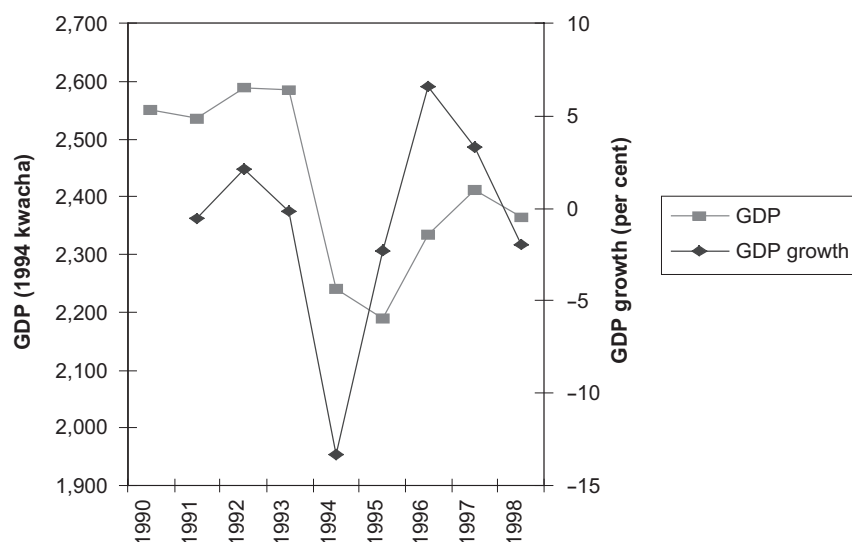


Figure 9.2 Real GDP and real GDP growth over the 1990s

by one-third in that year. Manufacturing too was hit by the implementation of the trade reforms, along with the high interest rates resulting from the government's monetary policy, and production declined by almost one-third between 1992 and 1996.

In 1996 there was a slight recovery in mining and manufacturing. This resulted in positive GDP growth in 1996 and 1997, the only two years in the 1990s with positive per capita growth. Figure 9.2 shows GDP and GDP growth over the 1990s (IMF, 1999).

Employment data for the 1990s are readily available only for formal sector activities. The formal sector employed just 17 per cent of the labour force in 1991 and has declined by 15 per cent per annum to less than 10 per cent of total employment. Most of the decline in formal sector employment resulted from major restructuring in the mining and manufacturing sectors, which commenced in 1992. The number of mining and quarrying workers declined by over 40 per cent during 1991–1998. The impact was particularly pronounced in the textile industry, which has almost collapsed. Employment in agriculture, forestry and fishing remained constant until 1994, but declined thereafter. Conversely, employment in construction collapsed between 1990 and 1995 to less than one-third of its 1990 level, but has since seen strong growth. Similarly, employment in transport and communications and in distribution and trade saw small reductions between 1992 and 1995, but has been growing

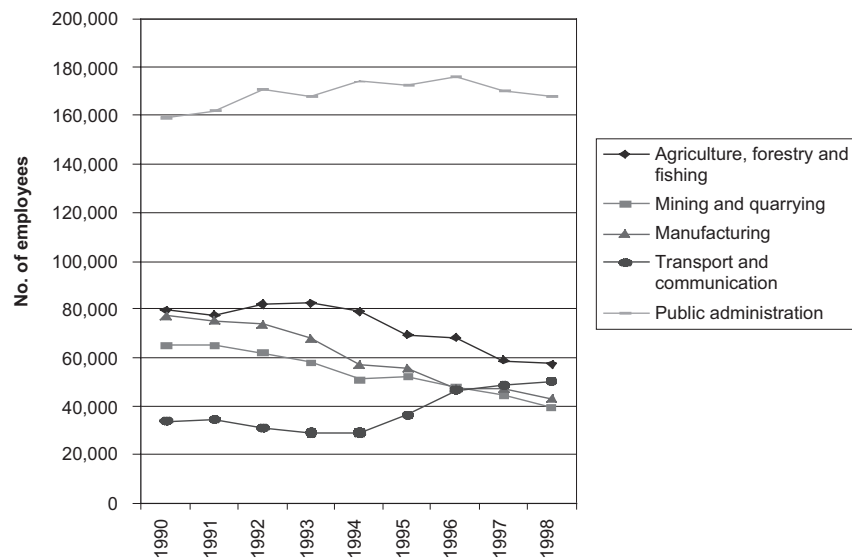


Figure 9.3 Employment by sector for selected sectors, 1990–1998

since the mid-1990s. Figure 9.3 shows employment by sector for selected sectors. Despite the introduction of a public sector reform programme, employment in public administration appears to rise until 1996, although it has reduced slightly since (Seshamani and Kaunga, 1999). However, there have been heavy job losses in the parastatal sector.

Declining employment in the formal sector displaced a large number of workers into the informal sector. Data on informal sector employment are poor. The Central Statistical Office estimates that total informal sector employment was around 2.3 million in 1993, of whom around 59 per cent were self-employed or owner-operators; the others were employed in small enterprises or were unpaid family workers (RofZ, 1997b). Informal sector employment has grown substantially in recent years: there was a 35 per cent increase in informal agricultural employment and a 15 per cent increase in informal non-agricultural employment between 1995 and 1998 (RofZ, 1999a).

It is also instructive to look at the impact of reform upon earnings. Figure 9.4 shows average real monthly earnings between 1992 and 1997 for employees in central and local government, parastatals and the private sector. Average monthly real earnings in the formal sector rose steadily during 1992–1995, but declined by over 10 per cent during 1995–1996 as real earnings fell in both central government and the private sector. The increase in overall real average earnings is driven by the high

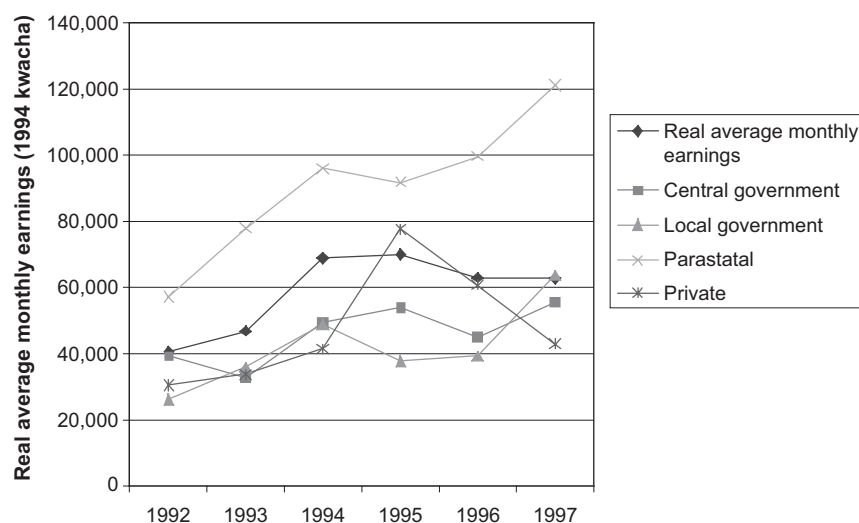


Figure 9.4 Average real monthly earnings by employer, 1992–1997

and rising real earnings in the parastatal sector, which appear to have more than doubled in real terms over the period. Real earnings in local and central government and the private sector also rose over the period, although private sector earnings have sharply declined since 1995.

However, figure 9.4 should be interpreted with some caution. The general rise in average earnings in central government, the parastatal sector and the private sector between 1992 and 1995 suggests that layoffs in these sectors focused on the least skilled and therefore lowest paid workers. The large rise in parastatal sector earnings since 1995 combined with the collapse of private sector earnings may be the result of re-classifying low-paid workers from the parastatal sector as private sector workers.

4.2 Changes in poverty and inequality during the 1990s

In order to understand how the reforms have affected poverty and inequality in Zambia, three nationally representative household surveys from 1991, 1996 and 1998 were examined to determine the changes in poverty and inequality during the decade.⁹ Each of these surveys was nationally representative, covering all nine provinces and both urban and rural areas.¹⁰ The questionnaires generally covered demographic characteristics, health care, education, economic activities, housing facilities and amenities, access to facilities, migration, agriculture, non-farm

enterprises, household income, household cash expenditure, household assets and anthropometry. Unfortunately, there were significant changes in the format and content of the income questions over the surveys, although the expenditure questions remained relatively unchanged. For both these and theoretical reasons, consumption expenditure was chosen as the welfare measure.¹¹ In order to compare aggregate consumption expenditures across different years, it is important that the measure reflects expenditure on the same items in each year. We therefore reconstructed a total expenditure variable for 1991, 1996 and 1998 comprising the following components: food, education, health, clothing, housing and transport.¹²

In order to compare welfare across households with different compositions, we employ the equivalence scale used by Latham (1965).¹³ To calculate poverty measures, we have used the poverty line defined by the Zambian Central Statistical Office (CSO), which is based on a cost of basic needs approach. A study carried out by the National Food and Nutrition Commission constructed a basic food basket necessary to maintain the nutritional requirements of an average Zambian family.¹⁴ The cost of this food basket translates into a lower poverty line of K961 per adult person per month in 1991 prices. A further 30 per cent was added to this amount to account for basic non-food needs, giving an upper poverty line of K1,380 per month. These values were upgraded to 1998 prices using the ratio of the composite national consumer price index in November 1998 to that in October 1991 (RofZ, 2000) and then adjusted to give per adult equivalent lower and upper poverty lines of K32,840 and K47,158.¹⁵

For purposes of international comparison, a US\$1/day poverty line was also calculated using the purchasing power parity exchange rates in the Penn World Tables (Summers and Heston, 1999) and the Zambian Consumer Prices Index (RofZ, 1997a). This resulted in a per capita poverty line of K140,642 per month in 1998 prices. This is exceptionally high in the Zambian context, falling in the top decile of the 1998 consumption expenditure distribution. It was therefore decided not to use this poverty line in our analysis.

Table 9.2 shows the mean per adult equivalent consumption expenditure for 1991, 1996 and 1998 (all figures are in 1998 kwacha). Population standard errors are reported that take into account the stratification and clustering of the surveys. The table shows a decline of over a quarter in mean real expenditure between 1991 and 1996.¹⁶ Although urban residents are substantially better off than rural residents, table 9.2 shows that most of this fall comes from a sharp, and statistically significant, fall of over a quarter in the mean expenditure of households in urban areas. The mean expenditure of rural residents fell only by 5 per cent between

Table 9.2 Mean per adult equivalent real consumption expenditure, 1991, 1996 and 1998

	1991	1996	1998	Change (per cent)		
				1991–96	1996–98	1991–98
<i>National</i>						
Mean (kwacha)	47,840	35,561	40,245	−25.7	13.2	−15.9
Standard error	5,665.9	2,945.1	2,437.5			
Sample size	9,321	11,740	16,625			
<i>Rural</i>						
Mean (kwacha)	25,942	24,594	30,678	−5.2	24.7**	18.3*
Standard error	2,064.1	1,527.5	683.4			
Sample size	3,559	5,230	8,418			
<i>Urban</i>						
Mean (kwacha)	74,204	54,291	56,196	−26.8**	3.5	−24.3**
Standard error	5,881.4	2,483.8	2,697.5			
Sample size	5,762	6,510	8,207			

Source: Authors' compilation.

Notes: * change significant at 5 per cent level; ** change significant at 1 per cent level. 152 rural households and 400 urban households with implausibly low food expenditure in 1991 have been dropped, along with 43 households with highly inconsistent data at the top of the 1991 distribution; 8 outlier households at the top of the 1998 distribution were also dropped.

1991 and 1996, but this was from a much lower base and the change is not statistically significant.

By contrast, between 1996 and 1998 the national mean per adult equivalent consumption expenditure increased by 13 per cent, although the change is not statistically significant.¹⁷ Most of this increase resulted from a large and statistically significant increase of 25 per cent in rural mean expenditure. The mean consumption expenditure of urban residents also rose slightly between 1996 and 1998, although the change was not statistically significant. Because of these increases, the mean expenditure of rural residents was almost a fifth higher in 1998 than in 1991. Urban residents, in contrast, were on average 24 per cent worse off in 1998 than in 1991.

Population estimates of poverty were calculated using the Foster–Greer–Thorbecke poverty measures (Foster, Greer and Thorbecke, 1984), with $\alpha = 0, 1$ and 2. These correspond to the headcount poverty rate, the poverty gap and the squared poverty gap. The two national poverty lines (adjusted for differences in equivalence scale, as mentioned above) of K32,840 and of K47,158 per adult equivalent per month at 1998 prices were used.

Table 9.3 National poverty measures using per adult equivalent expenditure, 1991, 1996 and 1998 (per cent)

Poverty measures	1991	1996	1998
<i>Upper poverty line (K47,158)</i>			
Headcount	69.6 (0.48)	80.0 (0.37)**	76.1 (0.33)***+
Poverty gap	42.2 (0.38)	46.0 (0.29)**	40.6 (0.24)***+
Squared poverty gap	31.0 (0.34)	31.2 (0.26)	26.1 (0.20)***+
<i>Lower poverty line (K32,840)</i>			
Headcount	57.5 (0.51)	66.7 (0.43)**	60.5 (0.38)***+
Poverty gap	32.8 (0.37)	33.8 (0.29)*	28.2 (0.23)***+
Squared poverty gap	23.5 (0.32)	21.2 (0.23)**	16.6 (0.17)***+

Source: Authors' compilation.

Notes: Standard errors for each poverty measure are given in parentheses below each value. * change in poverty between 1991 and 1996 (1996 column) or between 1996 and 1998 (1998 column) significant at 5 per cent level; ** change in poverty between 1991 and 1996 (1996 column) or between 1996 and 1998 (1998 column) significant at 1 per cent level; + change in poverty between 1991 and 1998 (1998 column) significant at 5 per cent level; ++ change in poverty between 1991 and 1998 (1998 column) significant at 1 per cent level.

Table 9.3 shows the population estimates of poverty for 1991, 1996 and 1998. The headcount poverty rate using the upper poverty line rose between 1991 and 1996 from 70 per cent to 80 per cent, but then fell to 76 per cent in 1998; the same pattern was observed using the lower poverty line. The poverty gap and the squared poverty gap followed a similar pattern, increasing between 1991 and 1996 and decreasing between 1996 and 1998 (although the squared poverty gap using the lower poverty line fell slightly between 1991 and 1996).¹⁸

Although Zambia is, by SSA standards, a very urbanized society, 63 per cent of the population live in rural areas. It is therefore useful to break down the analysis of poverty into rural and urban areas. Table 9.4 shows the headcount poverty rate, poverty gap and squared poverty gap in each year for rural and urban areas separately. There was a substantial change in the geographical incidence of poverty in Zambia over the 1990s. In 1991, poverty was far more prevalent in rural areas than in urban areas: headcount poverty in rural areas for the upper poverty line was almost 90 per cent whereas in urban areas it was 47 per cent.

Table 9.4 Poverty measures for rural and urban areas using per adult equivalent expenditure, 1991, 1996 and 1998 (per cent)

Poverty measures	Rural			Urban		
	1991	1996	1998	1991	1996	1998
<i>Upper poverty line</i> (K47,158)						
Headcount	88.3 (0.54)	90.5 (0.41)**	86.3 (0.38)**	47.2 (0.66)	62.1 (0.60)**	59.3 (0.54)**
Poverty gap	61.8 (0.54)	57.4 (0.39)**	50.4 (0.32)**	18.6 (0.34)	26.6 (0.34)**	24.4 (0.29)**
Squared poverty gap	48.4 (0.55)	40.9 (0.38)**	33.9 (0.29)**	10.0 (0.23)	14.7 (0.25)**	13.1 (0.21)**
<i>Lower poverty line</i> (K32,840)						
Headcount	81.0 (0.66)	81.1 (0.54)	73.8 (0.48)**	29.3 (0.60)	42.2 (0.61)**	38.3 (0.54)**
Poverty gap	51.7 (0.59)	44.7 (0.42)**	37.1 (0.32)**	10.1 (0.26)	15.2 (0.28)**	13.4 (0.24)**
Squared poverty gap	38.9 (0.56)	29.2 (0.36)**	22.6 (0.26)**	5.1 (0.17)	7.6 (0.18)**	6.5 (0.15)**

Source: Authors' compilation.

Notes: See table 9.3.

However, the increase in urban poverty over the decade, combined with the improvement in the rural standard of living between 1996 and 1998, resulted in a rural headcount poverty rate of 86 per cent compared with an urban rate of 59 per cent in 1998. Urban areas are still better off than rural ones, but the difference has narrowed.

In rural areas, the headcount poverty rate at the upper poverty line rose slightly from 88 per cent to 90 per cent between 1991 and 1996, but then fell back to 86 per cent in 1998. However, the reduction in rural poverty between 1996 and 1998 at the lower poverty line was much more marked, suggesting that many households were lifted above the lower poverty line but the increase in their consumption expenditure was not large enough to enable them to cross the upper poverty line. Furthermore, the poverty gap and the squared poverty gap fell significantly throughout the 1990s, suggesting a moderately pro-poor pattern of growth in rural areas.

In urban areas, by contrast, there was a dramatic increase in all three poverty measures between 1991 and 1996. There was then a slight reduction in poverty between 1996 and 1998, although poverty in 1998 remained significantly higher than in 1991 for all three measures and both poverty lines.

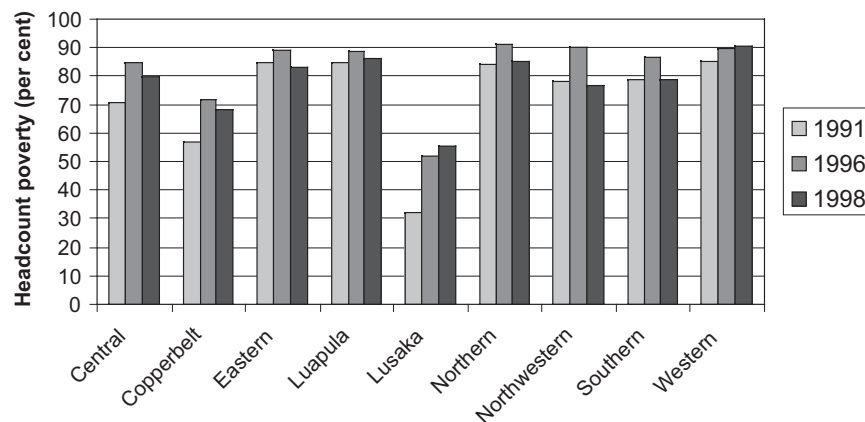


Figure 9.5 Headcount poverty rates by province, 1991, 1996 and 1998

It is also instructive to examine the incidence of poverty across different regions and socio-economic groups. Figure 9.5 shows the headcount poverty rate for each of the nine provinces for 1991, 1996 and 1998 using the upper poverty line of K47,158 per adult equivalent. The proportion of the population below the poverty line increased in every province between 1991 and 1996. The largest increases occurred in the most urbanized provinces – Lusaka, Central and Copperbelt – which is consistent with the picture of rising urban poverty shown in table 9.4. Further, these provinces saw little or no reduction in their headcount poverty rate between 1996 and 1998, with the result that the headcount poverty rates in these provinces were much higher in 1998 than in 1991. In Lusaka in particular headcount poverty rose by 74 per cent from 1991. However, all provinces except Lusaka and Western saw a decrease in the headcount poverty rate between 1996 and 1998, with the result that headcount poverty remained virtually unchanged between 1991 and 1998 in five provinces (all predominantly rural) and rose sharply in four provinces (all predominantly urban except for the Western province).

The fact that the largest reductions in poverty between 1996 and 1998 seem to have occurred in some of the poorest provinces suggests that the changes have been relatively pro-poor. To explore this further, we examined the growth in per adult equivalent consumption expenditure for each decile of the expenditure distribution – these are shown in figure 9.6. Between 1991 and 1996 the bottom three deciles of the distribution showed strong positive consumption growth.¹⁹ By contrast, the next five deciles experienced a contraction in their consumption expenditure, with larger reductions being experienced by households with higher

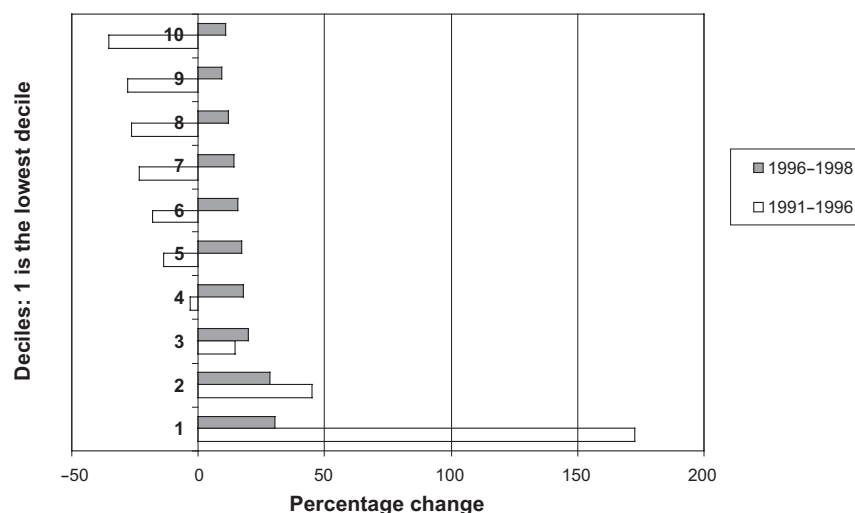


Figure 9.6 National percentage change in per adult equivalent expenditure by decile, 1991–1996 and 1996–1998

expenditure. A similarly pro-poor pattern of growth emerges for the changes between 1996 and 1998, with all deciles experiencing an increase in mean expenditure and poorer deciles having larger percentage increases than richer ones.

Although examining changes in poverty by decile reveals much about the pattern of growth, deciles themselves often do not constitute a useful grouping for policy analysis. It is therefore helpful to examine the changes in poverty by socio-economic group. None of the surveys constructed a detailed classification of households by socio-economic group, but the surveys were stratified by four household types in rural areas (small-, medium- and large-scale agricultural and non-agricultural) and by the quality of residential area (low, medium and high cost) in urban areas. Figure 9.7 presents the headcount poverty rate by these strata. The incidence of poverty in 1991 was highest amongst small- and medium-scale agricultural households and remained high in 1996. There was a small fall in the headcount poverty rate for small-scale farmers between 1996 and 1998 and a slight rise for medium-scale farmers.²⁰ However, the headcount poverty rate for rural non-agricultural households increased substantially between 1991 and 1996 and recovered only slightly between 1996 and 1998.

The situation for the urban strata was quite different. Poverty rose in all three urban strata between 1991 and 1996. Between 1996 and 1998,

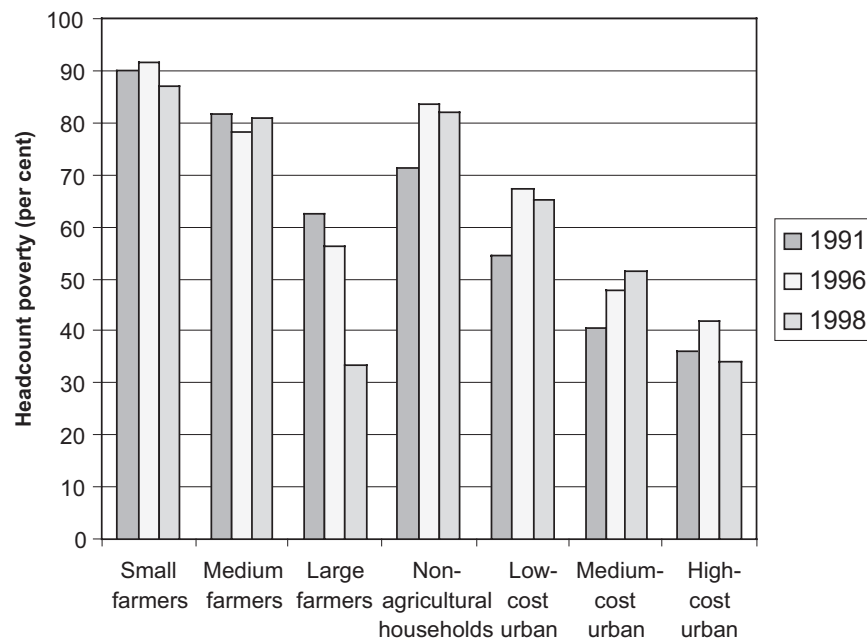


Figure 9.7 Headcount poverty rates by stratum, 1991, 1996 and 1998

poverty in low-cost areas fell slightly, whereas in medium-cost areas it continued to rise. In high-cost areas, by contrast, poverty fell, perhaps reflecting the greater ability of relatively wealthy households to adjust to new circumstances.

4.3 Inequality measures

In order to assess the extent to which the distribution of consumption expenditure changed over the 1990s, a number of inequality measures were calculated for all three years. To check the robustness of the results to the choice of measure, five different measures were used: the coefficient of variation; standard deviation of logs; the Gini coefficient; Theil's entropy measure; and Theil's mean log deviation. Each of these measures emphasizes different parts of the distribution (see Cowell, 1995, for an exposition of their properties).

Table 9.5 shows that there was a drop in inequality between 1991 and 1996, with the Gini coefficient falling from 0.588 to 0.503. This drop occurs regardless of the inequality measure used, although the fall is much larger for the coefficient of variation than for the other inequality

Table 9.5 National, rural and urban inequality measures using per adult equivalent expenditure, 1991, 1996 and 1998

	1991	1996	1998
<i>National</i>			
Coefficient of variation	3.013	1.699	1.622
Standard deviation of logs	1.414	0.928	0.867
Gini coefficient	0.588	0.503	0.486
Theil entropy measure	0.794	0.520	0.496
Theil mean log deviation measure	0.783	0.455	0.419
<i>Rural</i>			
Coefficient of variation	3.684	2.217	1.981
Standard deviation of logs	1.440	0.854	0.824
Gini coefficient	0.616	0.477	0.481
Theil entropy measure	0.926	0.527	0.538
Theil mean log deviation measure	0.852	0.405	0.408
<i>Urban</i>			
Coefficient of variation	2.467	1.200	1.232
Standard deviation of logs	0.823	0.785	0.757
Gini coefficient	0.474	0.441	0.431
Theil entropy measure	0.557	0.377	0.370
Theil mean log deviation measure	0.402	0.335	0.320

Source: Authors' compilation.

measures, suggesting that movements in the tails of the expenditure distribution were responsible for much of the change. A further, smaller drop in inequality was experienced between 1996 and 1998, with the Gini falling to 0.486. Table 9.5 also shows inequality measures for the rural and urban consumption expenditure distributions separately. Rural inequality also declined between 1991 and 1996 for all inequality measures. However, although the coefficient of variation and the standard deviation of logs show a continued decline between 1996 and 1998, all other inequality measures show a small increase in rural inequality. Thus, notwithstanding changes in the tails of the distribution to which the coefficient of variation is particularly sensitive, an initial fall in inequality between 1991 and 1996 appears to have been counteracted by a subsequent small rise as growth picked up in rural areas.

The evolution of urban inequality shows a similar pattern between 1991 and 1996, with inequality falling according to all measures. However, in contrast to rural areas, between 1996 and 1998 all measures except for the coefficient of variation show a continued fall in inequality. Overall, the changes in the urban expenditure distribution were small. Despite the small rise in inequality in rural areas between 1996 and 1998, national inequality fell over this period. This is because inequality

between the rural and urban areas declined as expenditure in rural areas grew faster than in urban areas.

Table 9.6 calculates the inequality measures for each province and reveals a number of variations from the national picture. Most provinces show strong declines in inequality between 1991 and 1996. In Luapula and Lusaka, however, inequality measures are ambiguous – some show increases in inequality over the period. Between 1996 and 1998, Central, Copperbelt, Lusaka, Southern and Northwestern provinces all show an increase in inequality, while all other provinces show declines.

5 Linking policy reform to changes in poverty and inequality

The changes in poverty and inequality described above reflect the interaction of the economic policies pursued with external economic and weather-related shocks. It is, of course, extremely difficult to determine clear causal links between the implementation of particular policies and changes in poverty and inequality. Furthermore, it is hard to disentangle the impact of one policy from another as well as the relative importance of policy and external shocks.²¹ Nonetheless, we attempt to infer the likely impact of different policies by examining the nature and timing of the reforms undertaken. We consider first rural areas and then urban ones.

Several factors are likely to have had a strong impact upon the standard of living in rural areas during the 1990s. The most important of these were weather-related shocks, notably the devastating droughts of 1992 and 1994, which had a strong negative impact upon poverty. Policy also played an important role. However, it is likely to be the policies of *internal* rather than *external* liberalization that had the greatest impact upon poverty in rural areas. The removal of pan-territorial and pan-seasonal maize pricing may have encouraged a more economically rational allocation of resources in rural areas. However, there is evidence that this had a negative impact on farmers in more remote areas, who benefited from the implicit subsidy that it entailed (Drinkwater et al., 1996; Francis et al., 1997; Oxfam and IDS, 1999). Conversely, farmers near railway lines or major roads are likely to have benefited from this change, particularly after the removal of maize/meal subsidies in urban areas. It is notable that the headcount poverty rates shown in figure 9.7 rose for small-scale farmers between 1991 and 1996 but fell for medium-scale farmers, who may have benefited more from the higher prices obtained for maize.

However, the costs of maize market liberalization do not appear to

Table 9.6 Inequality measures by province using per adult equivalent expenditure, 1991, 1996 and 1998

Province	1991	1996	1998	Change (per cent)		
				1991–96	1996–98	1991–98
<i>Central</i>						
Coefficient of variation	1.074	1.005	2.501	–6.4	148.9	133.0
Standard deviation of logs	1.083	0.792	0.922	–26.9	16.5	–14.8
Gini coefficient	0.485	0.427	0.543	–11.9	27.0	12.0
Theil entropy measure	0.415	0.329	0.749	–20.8	127.9	80.6
Theil mean log deviation measure	0.475	0.314	0.537	–34.0	71.0	12.9
<i>Copperbelt</i>						
Coefficient of variation	2.060	1.054	1.325	–48.9	25.8	–35.7
Standard deviation of logs	0.810	0.762	0.783	–6.0	2.8	–3.4
Gini coefficient	0.439	0.422	0.440	–3.8	4.2	0.3
Theil entropy measure	0.465	0.337	0.381	–27.5	12.9	–18.2
Theil mean log deviation measure	0.355	0.308	0.334	–13.3	8.5	–6.0
<i>Eastern</i>						
Coefficient of variation	1.499	2.151	1.162	43.5	–46.0	–22.5
Standard deviation of logs	1.419	0.860	0.786	–39.4	–8.7	–44.6
Gini coefficient	0.599	0.505	0.440	–15.8	–12.9	–26.7
Theil entropy measure	0.670	0.585	0.373	–12.7	–36.2	–44.3
Theil mean log deviation measure	0.797	0.447	0.334	–43.9	–25.2	–58.0
<i>Luapula</i>						
Coefficient of variation	1.982	3.950	1.129	99.3	–71.4	–43.0
Standard deviation of logs	1.211	0.865	0.767	–28.6	–11.3	–36.7
Gini coefficient	0.560	0.549	0.433	–1.8	–21.2	–22.7
Theil entropy measure	0.669	1.014	0.359	51.6	–64.6	–46.3
Theil mean log deviation measure	0.653	0.563	0.321	–13.8	–42.9	–50.8
<i>Lusaka</i>						
Coefficient of variation	1.211	1.206	1.302	–0.4	7.9	7.5
Standard deviation of logs	0.891	0.831	0.814	–6.7	–2.0	–8.7
Gini coefficient	0.445	0.455	0.460	2.1	1.1	3.3
Theil entropy measure	0.385	0.398	0.422	3.2	6.1	9.5
Theil mean log deviation measure	0.370	0.364	0.368	–1.6	1.1	–0.5
<i>Northern</i>						
Coefficient of variation	1.545	1.296	1.012	–16.1	–21.9	–34.5
Standard deviation of logs	1.166	0.836	0.764	–28.2	–8.7	–34.5
Gini coefficient	0.556	0.457	0.416	–17.8	–8.9	–25.2
Theil entropy measure	0.593	0.406	0.317	–31.5	–21.9	–46.6
Theil mean log deviation measure	0.614	0.367	0.300	–40.2	–18.2	–51.0

Table 9.6 (cont.)

Province	1991	1996	1998	Change (per cent)		
				1991–96	1996–98	1991–98
<i>Northwestern</i>						
Coefficient of variation	7.416	1.209	1.699	−83.7	40.5	−77.1
Standard deviation of logs	1.378	0.773	0.813	−43.8	5.1	−41.0
Gini coefficient	0.676	0.429	0.488	−36.6	13.8	−27.8
Theil entropy measure	1.666	0.362	0.530	−78.3	46.5	−68.2
Theil mean log deviation measure	1.010	0.321	0.410	−68.2	27.8	−59.4
<i>Southern</i>						
Coefficient of variation	5.078	1.374	1.913	−72.9	39.2	−62.3
Standard deviation of logs	1.932	0.907	0.943	−53.1	4.0	−51.2
Gini coefficient	0.682	0.483	0.521	−29.2	7.9	−23.6
Theil entropy measure	1.334	0.464	0.593	−65.2	27.8	−55.6
Theil mean log deviation measure	1.273	0.421	0.494	−66.9	17.3	−61.2
<i>Western</i>						
Coefficient of variation	5.337	1.327	1.833	−75.1	38.2	−65.6
Standard deviation of logs	1.423	0.987	0.812	−30.7	−17.7	−43.0
Gini coefficient	0.719	0.499	0.462	−30.5	−7.5	−35.8
Theil entropy measure	1.635	0.474	0.495	−71.0	4.3	−69.8
Theil mean log deviation measure	1.150	0.446	0.382	−61.2	−14.5	−66.8

Source: Authors' compilation.

have fallen disproportionately on the poor. Indeed, the largest proportionate reductions in consumption expenditure appear to have been experienced by non-agricultural households and, possibly, by large-scale farmers.²² Non-agricultural households were affected negatively by the increase in maize prices associated with the removal of subsidies, but had no compensating increase in their incomes from net sales of maize or any reduction in their costs from the deregulation of maize milling. Large-scale farmers, as intensive users of fertilizer and credit, are likely to have been more affected by the removal of input subsidies and the huge increase in interest rates resulting from the stabilization policies of the early 1990s. Since non-agricultural households and large-scale farmers were the best-off households in rural areas in 1991, the fact that they were the two hardest-hit groups helps to explain the substantial equalization of the rural expenditure distribution between 1991 and 1996. Similarly, the existence of both winners and losers in rural areas may explain why our study shows little change in the headcount poverty rate in rural areas between 1991 and 1996.

Between 1996 and 1998 the private sector began to fill the gaps in the provision of inputs and marketing services after the withdrawal of formal public provision.²³ Furthermore, exchange rate and capital market liberalization may have enabled better-off farmers to obtain funds for investment in more profitable crops (for example, groundnuts and export horticulture). This, along with better weather and national economic performance, resulted in strong growth in rural areas between 1996 and 1998 and a substantial reduction in all poverty measures. The principal beneficiaries of this growth appear to have been small-scale farmers, although poverty also fell for non-agricultural households and large-scale farmers; poverty rose for medium-scale farmers. Since the largest gains accrued to both the best- and the worst-off in rural areas, the changes in inequality have been of ambiguous sign.

In urban areas, the poor suffered substantial losses resulting from escalating inflation between 1991 and 1993. Although the subsequent stabilization was successful in reducing inflation, the resulting severe recession hit urban areas hard. The negative effect of stabilization was reinforced by the almost simultaneous removal of subsidies on mealie meal. Furthermore, although structural reform in the parastatal sector was slow in the early 1990s, employment in the sector fell by one-third between 1992 and 1996 and there was no commensurate increase in any other part of the formal sector. Much, but by no means all, of this fall came from continued decline in the mining sector, resulting from the decline in the international price of copper as well as from policy uncertainty surrounding the privatization of ZCCM. The combined effect of stabilization, subsidy removal and parastatal restructuring gave rise to the dramatic increase in poverty between 1991 and 1996. This also explains why the three provinces with the largest proportionate increase in headcount poverty were Central, Copperbelt and Lusaka – the three most urbanized provinces.

However, recession did not affect all urban households equally. The relative protection of employment and earnings in central and local government between 1991 and 1996 may explain why households in medium- and high-cost housing experienced smaller proportionate falls in their standard of living than those in low-cost housing. Nevertheless, the profile of the recession in urban areas between 1991 and 1996 was relatively “pro-poor” overall, in the sense that better-off households typically experienced larger percentage falls in their consumption expenditure than poorer households. This may reflect the greater access of better-off households in urban areas to the subsidies that were removed as well as a greater dependence upon wage income, the value of which was eroded by inflation. Thus, despite rising poverty, inequality in urban areas declined over this period.

Between 1996 and 1998 there was a slight recovery in urban areas. However, the acceleration of the privatization process in 1996, along with strong pressure from donors to reduce the size of the public sector, meant that formal sector employment continued to decline. Simultaneously, average earnings in the private sector fell, which may reflect increased international competition owing to the reduction in tariff barriers.²⁴ Households in medium-cost areas, many of whom are heavily reliant on the income from such employment, were badly hit by these changes, and poverty continued to rise in this group. Poverty in low- and high-cost areas fell, in keeping with the recovery at the national level; those in high-cost areas gained the most, suggesting that better-off households were more able to take advantage of the opportunities presented by the new economic environment. As a consequence, inequality rose in five of the nine provinces, including Central, Lusaka and Copperbelt.

6 Looking to the future: Is growth or redistribution the most effective way to reduce poverty?

Given the continuing high levels of poverty in Zambia, it is important that policy should adopt the most effective means of poverty reduction. Some forms of redistributive policy are likely to slow growth, and some growth strategies may worsen the distribution of income and consumption. To assess the relative effectiveness of growth and redistribution for poverty reduction, poverty–growth and poverty–inequality elasticities were calculated for each of the three years. The poverty–growth elasticity is the percentage change in poverty that would occur with an increase in mean expenditure of 1 per cent while keeping the distribution of expenditure fixed. Similarly, the poverty–inequality elasticity is the percentage change in poverty that would occur with an increase in the Gini coefficient of 1 per cent while keeping mean expenditure fixed. Thus a large (negative) poverty–growth elasticity would indicate that growth would be likely substantially to reduce poverty, and a large (positive) poverty–inequality elasticity would indicate that an improvement in the expenditure distribution would be likely substantially to reduce poverty. These measures have been used to assess the relative potential of growth and redistribution policies for poverty reduction in a wide variety of countries (Demery et al., 1995).²⁵

Poverty–growth and poverty–inequality elasticities were calculated for all three poverty measures for each year using both poverty lines. The results, which are shown in table 9.7, contain a number of interesting features. First, the poverty–growth elasticities are quite low for both poverty lines, regardless of the poverty measure used: using the lower

poverty line, a 1 per cent increase in mean expenditure reduces headcount poverty by between 0.57 and 0.74 per cent, depending on the year of the survey; using the upper poverty line results in even lower elasticities.²⁶ Second, poverty–growth elasticities are larger for measures more sensitive to the depth and severity of poverty. The poverty–growth elasticity for the squared poverty gap in 1996 is more than double the elasticity for the headcount for both poverty lines. Similarly, poverty–growth elasticities for the poverty gap are larger than those for headcount measures for any given year and poverty line. This suggests that growth may be more effective in reducing the severity of poverty than in simply reducing the proportion of the population who are poor. In addition, the results from 1996 and 1998 suggest that growth’s relative ability to reduce the depth and severity of poverty is enhanced the more equal is the initial distribution of expenditure. The poverty–growth elasticity for the squared poverty gap is 25 per cent higher than that for the headcount index for the lower poverty line in 1991; however, it is 107 per cent higher in 1996 and 89 per cent higher in 1998, years in which the expenditure distribution was more equal than that in 1991.

Table 9.7 also shows that the poverty–growth elasticities increase over time. This is surprising given the contraction in mean expenditure over the period (typically poverty–growth elasticities increase as the mode expenditure rises towards the poverty line). Again, the improvement in the expenditure distribution between 1991 and 1996 is responsible for the increase between these years, whereas the growth between 1996 and 1998 is principally responsible for the further increase in the poverty–growth elasticity in this period. It should also be noted that the poverty–

Table 9.7 Poverty–growth and poverty–inequality elasticities, 1991, 1996 and 1998

	1991		1996		1998	
Upper and lower poverty lines (1998 kwacha)	47,158	32,840	47,158	32,840	47,158	32,840
<i>Poverty–growth elasticities</i>						
Headcount	–0.52	–0.63	–0.40	–0.57	–0.49	–0.74
Poverty gap	–0.65	–0.75	–0.74	–0.97	–0.87	–1.15
Squared poverty gap	–0.73	–0.79	–0.95	–1.18	–1.11	–1.40
<i>Poverty–inequality elasticities</i>						
Headcount	0.01	0.29	–0.10	0.05	–0.07	0.17
Poverty gap	1.02	1.80	0.57	1.16	0.73	1.48
Squared poverty gap	2.04	3.27	1.28	2.26	1.54	2.77

Source: Compiled by McCulloch.

Table 9.8 Annual growth in per adult equivalent expenditure required to halve the headcount poverty rate by 2015

	Poverty line (1998 kwacha)	
	Upper	Lower
Starting distribution	47,158	32,840
Based on the 1991 distribution	0.043	0.038
Based on the 1996 distribution	0.044	0.037
Based on the 1998 distribution	0.037	0.029

Source: Compiled by McCulloch.

growth elasticities are smaller for the upper poverty line than for the lower for each poverty measure and year. This is a simple consequence of the scale of poverty in Zambia: poverty–growth elasticities will generally be lower, the further the poverty line is from the mode expenditure. In this case, the upper poverty line is above mean expenditure in 1996 and 1998, which itself is substantially above the mode expenditure.

Turning to the poverty–inequality elasticities, table 9.7 reveals a striking picture. The poverty–inequality elasticities are very low for the headcount measure of poverty.²⁷ However, the poverty–inequality elasticities for the depth and severity of poverty are much larger. Thus, although a 1 per cent increase in mean expenditure may be more effective than a 1 per cent reduction in the Gini coefficient in reducing the headcount poverty rate in Zambia, such a change in the distribution of expenditure is substantially more effective than growth in reducing the depth and, particularly, the severity of poverty.

It may also be noted that the poverty–inequality elasticities fell between 1991 and 1996, whereas they rose between 1996 and 1998. The fall between 1991 and 1996 occurred because of the contraction in mean expenditure. As mean expenditure approaches the poverty line, the impact of distributional change is reduced because, by definition, improvements in the distribution that hold the mean constant will not change the mean and therefore will not change the headcount poverty rate if the poverty line is the mean. Similarly, the increase in the poverty–inequality elasticity between 1996 and 1998 occurred because of the growth in mean expenditure between these two years.

7 Conclusions

During the 1990s, the Zambian government implemented one of the most radical programmes of structural adjustment in SSA. The intention

of this programme was to restructure the economy in order to boost long-term growth and poverty reduction. However, growth has generally been weak and poverty increased dramatically in urban areas between 1991 and 1996, largely because of the recession induced by stabilization and structural reform. Only between 1996 and 1998 was there a reduction in poverty concentrated in rural areas.

What policy lessons can be learnt from the 1990s? We outline four. First, reforms should be adjusted to account for external shocks. The large increase in poverty between 1991 and 1996 resulted in part from the devastating droughts of 1992 and 1994. However, the effect of the droughts was made worse by the implementation of strict stabilization measures. In addition, the government pressed ahead with the reform of the maize marketing system. Although stabilization measures were clearly necessary to control inflation, they undermined the success of the measures to reform the marketing system and resulted in unnecessary additional hardship for poor rural households. Conversely, the continued decline in the copper price made the sale and restructuring of ZCCM more rather than less urgent. The government's delay in effecting the sale probably resulted in a lower final sale price and a larger number of redundancies, and may have contributed to Anglo American's recent withdrawal from Zambia. Thus external shocks do not necessarily imply that reforms should be delayed. Rather, it is important that governments consider how the implementation of reform will be affected by the shock and whether any amendment in the reform might yield a better outcome in the changed circumstances.

Second, internal liberalization can have as large a poverty impact as external liberalization. Policy makers often focus attention on external aspects of liberalization such as exchange rate, trade and capital account liberalization. These are important and can play a role in enabling sustainable pro-poor growth. However, large constraints and costs are often associated with domestic policies and these can far outweigh the effect of border measures. This is particularly the case where institutional reforms are being undertaken. In Zambia, the impact of the liberalization of maize marketing and the failure to anticipate the collapse of markets for credit and inputs probably had a much greater impact than the external liberalization.

Third, in addition to protecting social expenditures during stabilization and adjustment (which appeared to happen to some extent), it is important to maintain expenditures that enable the poor to exploit new economic opportunities. The collapse of expenditure on transport and communications during Zambia's reforms appears to have compounded the difficulties faced by rural households, by discouraging the private sector from stepping in quickly to provide credit and input services after

the withdrawal of state provision. In general, policy makers need to be conscious of the complementary expenditures that may be necessary to ensure that structural reforms are successful and cautious about simultaneously implementing reforms that may jeopardize their ability to undertake such expenditures.

Fourth, the largest negative shock was experienced by urban households, who were hit by both rising prices and widespread redundancies, and by non-agricultural rural households, who also lost from rising prices. This points to the essential role of social safety nets during periods of adjustment. With few assets to sell, weak or non-existent markets for credit and few alternative means of generating income, the urban poor had little choice but to reduce consumption drastically in the early 1990s. The existence of a well-targeted social safety net at that time could have substantially reduced the burden that the reforms imposed upon the poor.

In the long run, both external liberalization and internal structural reforms should help to achieve sustainable pro-poor growth. Zambia's comparative advantage lies clearly in agriculture and this is also the principal income source for most of the poor. For rural areas, the agricultural and trade reforms of the 1990s have helped to ensure that prices for different crops reflect the costs of production. However, the failure to learn the above lessons has left many poor farmers unable to exploit their agricultural potential because of poor rural infrastructure and thin or non-existent markets for key agricultural inputs and services, notably fertilizer, credit and transport. Pro-poor growth in Zambia will require investment in key public goods, including improvements in rural marketing, extension services and infrastructure.²⁸ In urban areas, the need to maintain fiscal stability is likely to continue to place strong pressure on employment in the parastatal and public sectors, and trade liberalization may force further restructuring in traditional manufacturing industries. The future is likely to lie in the development of labour-intensive export-oriented agro-processing industries to add value to agricultural sector production. The government could help to reduce urban poverty by providing a conducive environment for such investment. However, given the large and sustained increase in urban poverty during the 1990s, it will also be important to develop more effective safety nets for the urban poor.

Notes

1. This section draws heavily on World Bank (1994b).
2. Data for 1959 show an overall Gini coefficient for income of 0.48. Figures for 1964 are not available.

3. White and Edstrand (1998) provide a detailed account of the operation of the Rights Accumulation Programme.
4. White (1998) discusses several different perspectives on the design and implementation of reforms in the 1990s. See Adam and Bevan (2000) on the cash budget.
5. In 1991/1992, 65 per cent of agricultural land planted was used for maize production.
6. The number of hammermills increased from 4,156 in 1992 to around 6,000 in 1994. See Jayne et al. (1996b) for a detailed analysis of the benefits of lower processing costs for low-income households.
7. Indeed, the MMD government was recently re-elected on a platform including the re-nationalization of maize marketing.
8. For an in-depth analysis of Zambia's management of copper price shocks in the earlier period between 1964 and 1980, see Aron (1999).
9. A further survey was undertaken in 1993. However, it was conducted at a different time of year than the 1991, 1996 and 1998 surveys and so it is impossible to know whether the differences found between 1993 and the other years are the result of seasonal factors or longer-term trends. Work by other researchers has shown that such time of survey biases can be severe (see Dercon, 1998). Consequently, we focus our analysis on the 1991, 1996 and 1998 surveys.
10. For details of the surveys used see RofZ (1993b, 1997c, 1999b).
11. See Ravallion (1992) for some of the arguments over the relative merits of income and consumption as welfare measures.
12. The inclusion (and exclusion) of items within any consumption aggregate is not uncontroversial because it can affect the conclusions drawn about whether aggregate consumption has increased or decreased among different segments of the population. Indeed, our results are different from those obtained by RofZ (1999b) as a result of the choices that we have made. Although we believe that our consumption aggregate benefits from being constructed to maximize comparability across years, this has necessitated the omission of items not included in all three surveys. A detailed description of the construction of our consumption aggregate is provided in McCulloch, Baulch and Cherel-Robson (2000).
13. This scale is slightly different from the one used by the Zambian CSO; consequently per adult equivalent consumption expenditure was recalculated using the Latham scale.
14. The food basket comes from ILO/JASPA (1981).
15. McCulloch, Baulch and Cherel-Robson (2000) give the details of this adjustment.
16. National accounts figures show a real decline of around 20 per cent in personal consumption.
17. National accounts show an increase in real GDP of 1 per cent between 1996 and 1998, although they show a rise of 20 per cent in real private consumption between 1996 and 1997.
18. The results reported by the Zambian CSO show the opposite, with poverty rising between 1996 and 1998 (RofZ, 1997c, 1999b). The difference is owing to the way in which the consumption expenditure aggregate is constructed – our aggregate measures the same items in each year, whereas the CSO results use the total consumption expenditure calculated from each survey.
19. The very high growth rate of the bottom decile between 1991 and 1996 may be an artefact of the 1991 data and we therefore do not place weight on this result. However, the overall pro-poor pattern of growth (and recession) is robust to the manner in which we have constructed the consumption aggregate.
20. The large changes in the headcount poverty rate for large-scale agricultural households may not be representative, given that there are very few such households in the sample. All of the other strata contain large samples.

21. See Bourguignon, de Melo and Suwa (1991) for an attempt to do precisely this using stylized CGE models of Latin American and African economies.
22. However, given the small sample size, we interpret the changes in mean consumption expenditure of large-scale farmers cautiously.
23. See Jayne et al. (2001) for evidence about the extent to which agricultural market reforms were actually implemented.
24. However, the interpretation of the change in average earnings in the private sector is ambiguous, as mentioned above.
25. Note that there is also a considerable debate in the empirical literature about whether initial inequality harms subsequent growth. See Deininger and Squire (1996); Partridge (1997); Persson and Tabellini (1994); and Ravallion (1997).
26. Demery et al. (1995) report poverty-growth elasticities for 1991 of -0.21 , -0.61 and -0.88 for the headcount poverty rate, poverty gap and squared poverty gap, respectively, although it is not clear whether these refer to the same poverty line as used here.
27. Indeed, the upper poverty line is so much higher than the mean in 1996 and 1998 that an increase in inequality would decrease the headcount poverty rate slightly.
28. This conclusion is in keeping with those of Alwang, Siegel and Jorgensen (1996), who suggest that microeconomic investments in labour-saving technology and credit facilitation have an important role to play in poverty reduction.

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Gender and education as determinants of household poverty in Nigeria

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1 Introduction

The relationship between gender and poverty has become an important topic in the literature on poverty, with gender now regarded as an essential element in the analysis and eradication of poverty. A large body of literature has focused on female-headed households and the disadvantages they face (Appleton, 1996; Buvinic and Gupta, 1997). It is now recognized that women are disproportionately represented among poor households and that poverty is being increasingly feminized. The term “feminization of poverty” appeared in the mid-1980s and was used to describe the growing proportion of women, and of households headed by women, in the ranks of the poor during the recession of the early 1980s and in the context of cutbacks in welfare programmes (United Nations, 1995a). The causes and outcomes of poverty are seen as heavily engendered, in contrast to traditional conceptualizations, which consistently neglected poverty’s gender dimensions, resulting in policies and programmes that failed to improve the lives of poor women and their families (Beneria and Bisnath, 1996). To eradicate poverty, the gender dimension needs to be addressed in development planning.

Analysis of female poverty suggests that the main causes arise from the perpetual disadvantages that women face in terms of their position in the labour market and their limited access to productive resources, education and income. Experience has shown that any approach to poverty

alleviation that leaves the economic situation of women unchanged tends to fall short of its goal (United Nations, 1995a).

Studies of poverty often take the household as the unit of analysis without differentiating between the levels of poverty of each household member. It is suggested that conventional household surveys do not allow direct measurement of income poverty among women. This is one reason that data on education and health, which can be collected at the individual level, are valuable because they provide a gender-disaggregated perspective on many dimensions of poverty (World Bank, 2000).

In examining the relationship between the gender of the household head and poverty, there are two questions to be answered (Appleton, 1996; Sahn, Arulpragasam and Merid, 1990). The first question is whether the gender of household heads can be used to predict poverty. The second concerns the likely determinants of poverty and the way these factors differ between male- and female-headed households. That is, what are the particular features of female-headed households that make them vulnerable to poverty, and what measures are required to reduce their vulnerability to poverty? Although evidence from some countries suggests that the incidence of poverty is higher in female-headed households, this is not always the case. Analyses of poverty among male-headed and female-headed households across a large number of developing countries have found mixed evidence. For example, surveys of household consumption and expenditure in many countries of North and South America, Europe and the Commonwealth of Independent States show the incidence of income poverty to be higher among female-headed households. Elsewhere, however, there is no difference between male- and female-headed households – in Zimbabwe, Viet Nam, Morocco and Indonesia, for example. According to Lipton and Ravallion (1995), females are not generally overrepresented in consumption-poor households; nor are female-headed households more likely to be poor as a rule (see, for example, Haddad, 1991, for Ghana, and Louat, Grosh and van de Gaag, 1995). A review of 61 studies on headship and poverty found female-headed households to be disproportionately represented among the poor in 38 cases (Buvinic and Gupta, 1997). In contrast, Quisumbing, Haddad and Pena (2000) found robust and statistically significant differences in poverty between female- and male-headed households in only two cases. Other recent studies find that evidence varies across countries, studies and methodologies (World Bank, 2001a). According to Kabeer (1992), little is known about the distribution of income or consumption in male-headed households below the poverty line. However, even if it were true that consumption-poverty incidence is on average no greater amongst women, women are serious victims of poverty in other

respects, for example access to education. The precarious position of women in the global economy is in part related to their low educational levels, including high levels of illiteracy in many countries (Beneria and Bisnath, 1996).

This chapter examines the linkages between the gender of household heads, education and household poverty in Nigeria between 1980 and 1996. Section 2 reviews the literature on the interrelationships between gender, education and poverty. Section 3 describes the data sources and methods used in the chapter. Section 4 discusses trends in poverty and inequality in Nigeria, and section 5 presents the model specification, estimation and testing procedures. Section 6 reports the results of the multivariate analysis. Past poverty alleviation programmes in Nigeria are reviewed in section 7, and section 8 concludes the chapter.

2 Review of the literature

2.1 *Gender and education*

In the past three decades, the United Nations has been at the forefront of efforts to improve the status of women. Several conferences and seminars within and between countries have focused on gender and education. Comprehensive plans of action have emerged on what needs to be done to address gender imbalance in education. In all countries, education is now recognized as a major vehicle for promoting and improving the status of women. It has been realized that sustainable human development is not possible if half of the human race remains ignorant and marginalized. According to the *Nairobi Forward-Looking Strategies for the Advancement of Women*, “education is the basis for the full promotion and improvement of the status of women. It is the basic tool that should be given to women in order to fulfil their roles as full members of the society” (United Nations, 1985), and the International Conference on Population and Development Programme of Action stated that “education, together with reproductive health, is one of the most important means of empowering women with the knowledge, skills, and self-confidence necessary to participate fully in the development process” (United Nations, 1995b: para. 42). Education is regarded as the cornerstone of women’s empowerment because it enables them to respond to opportunities, to challenge their traditional roles and to change their lives. This was reiterated in the *Human Development Report 1997* (UNDP, 1997), which stressed that an important strategy for empowering women is to promote their access to education.

The world conference on “Education for All”, held in Jomtien, Thailand, in 1991, drew attention to the gender gap in educational opportunity and its consequences for human development. The Beijing Platform for Action emphasized that investing in formal and non-formal education and training for girls and women has proved to be one of the best means of achieving sustainable development and economic growth. This view was supported by the World Bank, which stated that a country with more educated girls and women is not only healthier but also wealthier. Furthermore, recent research has shown that investment in education for girls is the single most effective way to reduce poverty. Even a few years of education empower women to have smaller families and to enjoy a higher standard of living. Educated mothers are more likely to send their children to school, creating a virtuous cycle of education and poverty reduction (DFID, 1999, 2000; Hill and King, 1995; Okojie, Chiege and Okpokunu, 1996).

The gap between human capital investments in men and women is highest in the low-income regions, which currently invest the least in the education of women compared with men (Schultz, 1994). Family preferences for boys’ education and the need for children’s labour services within and outside the household often limit the education of girls in rural communities (Beneria and Bisnath, 1996).

2.2 Gender and poverty

Because of the weakness of income/consumption indicators of gender inequality, the female-headed household is often used as an alternative indicator of the gender dimension of poverty. However, taking account of female-headed households will not capture women’s access to household income relative to men. The question is: are women poorer than men because more households headed by women than by men fall below the income poverty line? That is, is there widespread feminization of poverty? The UNDP (1997) answer to this question is “yes and no”, noting that women and men experience poverty in different ways. The feminization of poverty is not necessarily a question of whether more women than men are poor, but concerns instead the severity of poverty and the greater hardship women face in lifting themselves and their children out of the poverty trap. However, as mentioned earlier, even if it were true that consumption-poverty incidence is on average no greater amongst women, they are severely affected by poverty in other respects, for example in access to education and health services. The wide range of biases in society – unequal opportunities in education, employment and asset ownership – mean that women have fewer opportunities than men

(Beneria and Bisnath, 1996). Poverty accentuates gender gaps and, when adversity strikes, it is women who often are the most vulnerable.

It is asserted that gender-based poverty is a major feature of the African scene and that there is increased feminization of poverty in Africa (World Bank, 2001b). Factors contributing to this trend include: limited skills and knowledge; unfriendly market structures that concentrate women in lower-paying and time-consuming work and restrict their access to capital and credit; traditional family structures that perpetuate gender inequality through patriarchal norms of property ownership and inheritance; discrimination in the public domain; non-recognition of the value of women's work (World Bank, 2001a). The position of female-headed households is most serious when an economically active male is not present (or is working elsewhere). The lack of able-bodied male labour is a key characteristic of many of the poorest African households.

Lipton and Ravallion (1995) identified three key reasons that women are serious victims of human poverty. First, women work longer than men to achieve the same level of living, so the burden of both parts of the "double day" of market labour and domestic labour is more severe for poor women (see World Bank, 1997). Second, women have a lower chance of escaping from poverty, in part because their large share of domestic commitments prevents them from seizing new and profitable work opportunities as readily as men (see also World Bank, 1995). Third, in some cultures, widows face effective barriers against employment or remarriage, and are treated as second-class citizens within the home, leading to high risks of poverty. The World Bank (1997) also pointed out that feminized poverty persists because of women's low levels of education and training, poor health and nutritional status, and limited access to resources, which depress their quality of life and hinder economic efficiency and growth.

Employing another perspective, gendered dimensions of poverty can be understood by using the concepts of "entitlements" and "capabilities". In this respect, it is asserted that poor women's relatively low entitlements are the source of their dependency, vulnerability and low degree of autonomy. Similarly, limited capabilities associated with illiteracy or low educational attainment tend to lock them in to the vicious circle of poverty and deprivation (Beneria and Bisnath, 1996). In general, women tend to have less capacity than men in terms of education and training, less time to devote to productive resources and less command over important resources such as land and capital. Male-dominated societies also make the escape from poverty harder for women, suggesting that poverty is more likely to be chronic for women and transient for men.

2.3 Interrelations between gender, education and poverty

In recent years, attempts to explain gender inequalities in the accumulation of human capital have focused on the key role of household decision-making and the process of resource allocation in households. Family outcomes (for example, intra-household resource allocations) are the result of behavioural decisions taken in the light of a number of factors that are not observed by researchers and policy makers (Behrman, 1998: 223–242).

Inadequate investment in human capital is caused partly by poverty, which in its turn contributes to its perpetuation. Various determinants of investment in human resources and their relation to poverty are found in the simple Becker–Woytinsky lecture framework for the demand for and supply of human capital (Behrman, 1990). For poor families, the lower are public expenditure on education, parental educational attainment and the availability of non-earned income, the lower will demand for education be. Poverty can make parents discount future earnings very heavily. They may therefore limit human resource investment in their children and reinforce transgenerational poverty links. All other things equal, poverty may have an impact on schooling investments through the supply side, because the poor are less likely to have access to funds or to be able to afford transportation costs to schools of better quality (Behrman, 1990). Thus, from both the supply and demand sides, poverty leads to lower human capital investment in children, thereby promoting inter-generational transmission of poverty.

Poverty can influence girls' access to education in various ways. Gender disparities in education are often greatest among the poor. A recent study of boys' and girls' school enrolment in 41 countries indicates that, within countries, gender disparities in school enrolment rates are greater among the poor than among the non-poor (World Bank, 2001a). Similar patterns emerge when comparing poor and non-poor countries. Although gender equality in education has increased considerably over the past three decades in low-income countries, disparities in male and female school enrolments in these countries are still greater than in middle-income and high-income countries (World Bank, 2001a).

Evidence from West Africa also suggests that poverty may contribute to the gender gap in access to education (Appleton, 1996; Atolagbe, 1999; Okojie, 1998). As shown in the human capital model, households need to be able to afford school fees and the loss of child labour. Poor households that are unable to afford to educate all their children may give preference to boys because they perceive a higher benefit to boys' education in the labour market. Poorer households may also be more

dependent on their offspring for assistance in old age, and they are more likely to invest in sons if custom dictates that it is sons who should provide old age support. Thus, to the extent that education is not regarded as an investment good for girls, poor parents will be less willing to allocate resources to give their daughters its consumption benefits. Poorer households are also less able to afford domestic help and therefore make greater use of the child labour of their daughters in domestic work. This reduces their attendance in school, resulting in poor academic performance. All these possibilities provide reasons for gender differences in educational attainment being associated with household poverty (Appleton, 1996).

Female education raises various implications for the feminization of poverty. First, women with low human capital investment end up in low-status, low-income jobs and are likely to remain poor. Second, daughters of women with low human capital investment are likely to have low levels of human capital investment themselves, and therefore end up in low-status and low-income jobs like their mothers. Female poverty is thus transmitted from mothers' to daughters' generations. Third, discrimination in female access to education means that women will continue to have less education than men and be confined to low-income jobs, thereby perpetuating female poverty. Therefore, an important strategy for reducing female poverty is greater human capital investment in women.

3 Data sources and methods

3.1 Data sources

The analysis of the evolution of poverty and welfare over time in Nigeria has been difficult in the past because of data considerations. Under the National Integrated Survey of Households (NISH), four consumer expenditure surveys were conducted by the Federal Office of Statistics (FOS) in 1980, 1985, 1992 and 1996. They provide data that can be used to address issues of household welfare in some detail.

More details about the four datasets have been provided elsewhere (FOS, 1999). The national consumer surveys – which are supplemental modules of the NISH – have been part of FOS activities since 1953. Surveys were conducted on an ad hoc basis until 1980, when the first national consumer survey was conducted as part of NISH. In 1985, another enlarged survey was carried out; others followed in 1992 and 1996. The NISH programme is run in line with the United Nations Household

Survey Capability Programme. The design of the national consumer surveys follows the general NISH design.

Each national consumer survey (NCS) covers all the states in the federation, including the federal capital territory (Abuja). In each state, 120 enumeration areas are covered annually, with 10 areas randomly allocated to each month of the survey. From the selected enumeration areas, a sample of households (10) is covered each month for the general household survey, with five households sub-sampled for the NCS. A national household sample of 10,000 is aimed at. By 1996, however, with the number of states increasing to 30, the sample size was increased.

Adjustments for price differentials over time and for regional price differentials were made as follows:

- *Differentials over time:* If poverty situations are to be compared over time, price indices have to reflect temporal differences. The base year (1985) poverty line was kept constant and expenditure data for other years were deflated to base year prices, thus permitting analysis of poverty trends.
- *Regional price differentials:* In order to use total expenditure as the basis of measurement of standard of living, it was necessary to correct for regional price differences. Lagos State was taken as the base and deflation was done separately for urban and rural areas. Data from other points in the country were deflated to the price level of the base point. Separate deflators were also computed for food and non-food items where information was available (FOS, 1999) and allowance was made for seasonal price differentials.
- *Weighting procedure:* An important consideration in the data-cleaning process was the weighting procedure, which is described in the report by FOS. The weight used in the analysis was computed at the World Bank. Using this weighting factor amounted to using population figures as auxiliary variables, an accepted procedure for improving survey estimates (FOS, 1999).

3.2 Methods

Measurement of poverty

Poverty analysis requires that a poverty line be defined. In this study, per capita expenditure is used as the indicator of poverty, the unit of analysis is the household and the poverty line is that defined by the Federal Office of Statistics (FOS, 1999). Its approach was influenced by the fact that the data collected did not include intangibles or the physical quantities of food consumed. Total real per capita expenditure was used as a proxy for the standard of living of households interviewed. Households were

classified as poor or non-poor in relation to their level of total expenditure (food and non-food). Relative poverty standards were defined:

- a moderate poverty line equal to two-thirds of mean per capita expenditure, and
- a core poverty line equal to one-third of mean per capita expenditure.

Households were then classified into one of three groups determined by these poverty lines: (a) core (extreme) poor; (b) moderately poor; and (c) non-poor. Poverty lines for other years were constructed by raising these poverty lines by the value of the consumer price index relative to that for 1985.

Poverty indices

This study used the P_α class of measures proposed by Foster, Greer and Thorbecke (1984) given by:

$$P_\alpha = \frac{1}{n} \sum_{i=1}^q \left(\frac{z - y_i}{z} \right)^\alpha$$

where z is the poverty line, q is the number of persons below the poverty line, y_i denotes the income of the i 'th poorest person and α is a parameter that takes the value 0, 1 or 2, depending on the degree of concern about poverty. When $\alpha = 0$, the index is simply the headcount ratio (H), which measures the incidence of poverty, that is:

$$P_0 = q/n = H.$$

P_1 measures the relative per capita poverty shortfall, and P_2 reflects the severity of poverty.

One advantage of the P_α measure is that it is decomposable by population subgroups, allowing the overall level of poverty to be expressed as the sum of group measures weighted by their population shares; that is,

$$P_\alpha = \sum_{j=1}^m K_j P_{\alpha j},$$

where K_j is the population share of group j ($j = 1, 2, 3, \dots, m$) and $P_{\alpha j}$ is its poverty level. This property of the index implies that, when any group becomes poorer, aggregate poverty will increase. Also note that the proportional contribution C_j of group j to overall poverty is given by:

$$C_j = \frac{K_j P_{\alpha j}}{P_\alpha}.$$

Measures of inequality

Trends in inequality were analysed by calculating the Gini coefficient and entropy indices using the INEQDECO routine in STATA. In a Lorenz curve diagram, the Gini coefficient may be interpreted as the ratio of the area between the diagonal and the Lorenz curve divided by the total area of the triangle under the diagonal. It varies from 0 (perfect equality) to 1 (perfect inequality). Gini coefficients for high-inequality countries typically lie between 0.5 and 0.7.

Alternative measures of inequality are provided by the entropy family, which include the Theil coefficient:

$$GE(1) = \frac{1}{n} \sum_{i=1}^n \frac{y_i}{\mu} \ln \frac{y_i}{\mu}$$

and the mean logarithmic deviation:

$$GE(0) = \frac{1}{n} \sum_{i=1}^n \ln \frac{\mu}{y_i},$$

where μ denotes mean income. These indices can be decomposed into between-group and within-group components. Thus, if there are m groups with population sizes n_k and group mean incomes μ_k ($k = 1, \dots, m$), then the inequality index can be written as the sum of the within-group and between-group inequality terms as follows:

$$GE(1) = \sum_{k=1}^n \frac{n_k}{n} \frac{\mu_k}{\mu} GE_k(1) + \sum_{k=1}^m \frac{n_k}{n} \frac{\mu_k}{\mu} \ln \frac{\mu_k}{\mu}$$

$$GE(0) = \sum_{k=1}^m \frac{n_k}{n} GE_k(0) + \sum_{k=1}^m \frac{n_k}{n} \ln \frac{\mu}{\mu_k}$$

Multivariate analysis

The determinants of household welfare and poverty were examined using the model and estimation procedures described later.

4 Gender and trends in poverty and inequality in Nigeria

4.1 Descriptive statistics

Buvinic (1993) criticized studies of gender and household poverty for not disaggregating female-headed households by type of headship – that is,

by marital status of head – because households are heterogeneous. Such analysis shows that widows are most overrepresented among the poor (see Appleton, 1996; Sahn, Arulpragasam and Merid, 1990). Unfortunately, because of the aggregated nature of the data available for this analysis, it is not possible to distinguish the marital status of the household heads. Table 10.1 shows female headship and literacy rates and headcount poverty by state in Nigeria.

4.2 Gender and poverty trends

Recently analysed data on poverty show that the headcount poverty rate increased in Nigeria between 1980 and 1996 for both male- and female-headed households. This is presented in table 10.2.

Table 10.2 shows that, in 1980, poverty was higher in female-headed households, although since 1985 poverty has been higher in male-headed households. One possible explanation is that most female heads live in small households, whereas the incidence of poverty is highest in very large households. Rural and urban poverty levels followed national trends, with poverty higher in rural households regardless of whether the head is male or female. In 1996, the incidence of poverty was about the same in male- and female-headed households in urban areas.

The incidence of poverty also varies widely between zones. In 1980, poverty was higher in female-headed households in all zones. The incidence of poverty was generally higher in the northern zones for both male- and female-headed households. As regards the level of education, in 1980 poverty was higher in female-headed households except for those with primary education. In all the other years, poverty was lower in female-headed households, except in 1996 when female-headed households with secondary education recorded a higher incidence of poverty. In general, poverty declines as the level of education of the household head rises.

The two occupations where women are found in significant numbers are agriculture (rural women) and sales activities. There are fewer women in clerical and professional/technical occupations. Table 10.2 shows that only 12.2 per cent of women in sales occupations were poor in 1980, but this increased to 60.4 per cent by 1996. For heads employed in sales occupations in 1992 and 1996, the incidence of poverty was higher in female-headed households. Similarly, the incidence of poverty among female heads in agricultural occupations increased from 29.0 per cent in 1980 to 61.1 per cent in 1996. Over the same period, the poverty rate among female heads in professional/technical occupations decreased from 52.1 per cent to 47.8 per cent, probably because of women gaining access to better jobs owing to their higher educational attainment.

Table 10.1 Female headship rates, literacy rates and poverty incidence (per cent)

State/region	1991			1996
	Female headship rate	Female adult literacy rates	Percentage of female heads economically active	Poverty incidence
<i>Northeast region</i>		25.8		70.1
Adamawa	10.3	32.1	68.1	67.0
Bauchi	4.0	28.1	47.1	81.5
Borno	11.0	21.1	56.5	52.4
Taraba	6.9	22.4	67.7	63.0
Yobe	8.0	18.7	45.8	86.8
<i>Northwest region</i>		32.7		77.2
Jigawa	3.8	30.9	31.0	82.5
Kano	3.8	44.5	40.3	57.8
Katsina	4.7	30.6	35.6	71.8
Kebbi	3.9	23.0	39.7	82.6
Sokoto	4.1	25.1	38.7	83.9
<i>Central</i>		32.6		64.6
Benue	12.1	29.8	72.1	64.2
FCT (Abuja)	6.8	43.0	73.3	53.0
Kaduna	5.9	46.0	49.6	56.0
Kogi	25.3	38.0	76.4	87.3
Kwara	16.8	37.6	81.8	67.5
Niger	4.1	25.4	57.8	52.1
Plateau	6.1	32.7	58.3	65.9
<i>Southeast region</i>		51.1		53.5
Abia	27.7	55.6	82.1	58.6
Anambra	21.7	68.5	79.2	41.8
Enugu	24.2	40.2	79.3	56.8
Imo	26.8	58.2	62.5	53.6
<i>Southwest region</i>		57.4		60.9
Lagos	15.7	71.4	84.5	53.0
Ogun	25.9	44.1	87.0	69.9
Ondo	25.1	44.1	87.2	71.6
Osun	26.2	49.5	89.6	66.7
Oyo	20.4	51.0	90.2	49.0
<i>Southsouth</i>		57.5		58.2
Akwa Ibom	25.1	53.3	78.4	72.3
Cross River	25.7	51.5	82.1	61.5
Delta	32.5	49.4	79.9	59.3
Edo	23.4	47.8	75.3	53.3
Rivers	24.0	72.6	77.8	44.3
All Nigeria	15.2	44.0	76.0	70.3

Sources: FOS (1999); NPC (1998).

Table 10.2 Headcount poverty rate by gender of household head, sector, zone and characteristics of household head, 1980–1996 (per cent)

Region	1980		1985		1992		1996	
	Male	Female	Male	Female	Male	Female	Male	Female
All Nigeria	26.9	29.1	47.4	38.6	43.1	39.9	62.7	59.9
Urban	17.2	17.2	38.7	30.6	37.8	34.8	59.4	59.7
Rural	28.1	30.5	52.6	42.9	46.2	44.1	72.6	60.4
<i>Zone</i>								
Northeast	34.9	40.6	56.3	45.2	54.5	39.1	68.4	53.1
Northwest	37.6	39.1	52.3	46.7	37.0	21.6	68.6	62.3
Central	31.6	43.9	51.2	47.1	45.8	46.4	66.8	60.3
Southeast	9.1	26.4	31.8	23.2	41.5	38.4	68.3	61.6
Southwest	12.9	16.9	39.9	32.4	47.8	44.6	67.8	59.9
Southsouth	13.3	13.9	45.8	54.9	42.1	35.5	66.9	63.3
<i>Education</i>								
None	29.2	33.6	52.7	42.5	52.7	39.2	75.3	63.8
Primary	25.7	16.9	49.8	49.8	56.9	45.4	61.3	55.3
Secondary	16.8	32.1	41.4	33.0	70.3	36.6	53.3	56.0
Post-secondary	20.7	26.1	27.7	13.5	74.0	22.8	47.9	44.7
<i>Occupation</i>								
Professional/ technical	12.0	52.1	47.2	33.4	35.8	33.4	53.4	47.8
Administrative	1.1	0.0	73.4	30.9	23.9	0.0	24.2	0.0
Clerical	8.5	31.1	42.9	36.9	35.0	25.5	62.3	58.3
Sales	15.7	12.2	48.8	41.7	31.5	39.0	57.7	60.4
Services	21.0	24.7	49.7	42.2	37.4	41.1	76.7	42.6
Agriculture	31.7	29.0	47.3	34.2	48.4	40.4	73.1	61.1
Transport	15.4	70.2	41.4	38.1	38.3	55.6	65.1	69.8
Manufacturing	8.6	86.8	46.6	76.4	33.1	58.6	50.8	0.0
Others	1.6	100.0	47.9	76.6	42.1	45.6	62.7	62.8
Apprentice/ student	13.6	55.1	47.8	40.1	41.6	46.6	53.3	45.3
<i>Household size</i>								
1	0.1	0.6	0.6	0.9	2.7	3.3	9.1	17.8
2–4	8.5	10.7	19.3	19.3	17.1	29.7	50.9	54.4
5–9	29.7	37.9	50.6	49.5	44.8	52.2	74.7	81.2
10–20	50.6	60.2	70.9	76.4	65.5	79.9	88.9	78.3
20+	73.2	100.0	74.0	100.0	93.4	39.9	95.1	–

Source: Computed from FOS data on consumer expenditure surveys.

Poverty increased with household size in both male- and female-headed households, with the incidence of poverty being very high in households with more than nine members. This reflects the fact that nearly half of all household members in Nigeria are dependent children (NPC, 1998).¹

Table 10.3 Degree of inequality by gender of household head: Per capita expenditure, 1980–1996

	1980		1985		1992		1996	
Index	Male	Female	Male	Female	Male	Female	Male	Female
Gini	0.503	0.489	0.419	0.439	0.507	0.510	0.455	0.527
<i>Theil's index</i>								
<i>GE</i> (0)	0.435	0.455	0.298	0.329	0.450	0.467	0.357	0.491
<i>GE</i> (1)	0.524	0.446	0.355	0.401	0.560	0.507	0.426	0.662
<i>GE</i> (2)	1.555	0.783	0.747	1.086	2.457	0.963	0.971	2.266
<i>Theil's index all groups</i>								
<i>GE</i> (0)	0.437		0.304		0.483		0.375	
<i>GE</i> (1)	0.512		0.364		0.559		0.461	
<i>GE</i> (2)	1.479		0.807		2.296		1.202	
<i>Groups (male–female)</i>								
	Within	Between	Within	Between	Within	Between	Within	Between
<i>GE</i> (0)	0.437	0.00001	0.302	0.002	0.452	0.0006	0.371	0.004
<i>GE</i> (1)	0.516	0.00001	0.362	0.002	0.554	0.0006	0.456	0.004
<i>GE</i> (2)	1.479	0.00001	0.805	0.002	2.292	0.0006	1.197	0.004

Source: Computed from FOS data on consumer expenditure surveys.

4.3 Trends in inequality by gender of household head

Trends in inequality by gender of household head were examined. The Gini coefficients and entropy indices reported in table 10.3 show that there is a high degree of inequality among households. In 1980, female-headed households – which recorded higher levels of poverty – generally had a lower degree of (expenditure) inequality. The positions reversed in 1985, 1992 and 1996, when female-headed households had lower levels of poverty than male-headed households but a greater degree of inequality according to most inequality indices. Decomposition into within- and between-group (male and female) inequality shows that inequality was mainly within group (that is among members of the same group) rather than between group.

It needs to be recognized that it is difficult to draw firm conclusions about gender dimensions of poverty and inequality from standard headship analysis because of the heterogeneity of male- and female-headed households. In all the survey periods, female heads comprised 10–15 per cent of total respondents. As table 10.1 shows, the majority of women in Nigeria live in male-headed households. It is therefore necessary to examine poverty among women in male-headed households. The results of

this study suggest that the incidence of poverty is lower in female-headed households than in male-headed households.

5 Model specification, estimation and testing procedures

To examine the determinants of household welfare in more detail, two models were estimated. The first model tries to explain the sources of mean real per capita household expenditure expressed in logs. The second model estimates the likelihood of the household being poor. It was assumed that household per capita expenditure and the probability of being poor depend on vectors of variables representing personal, household and community characteristics as well as unobserved variables.

5.1 Welfare model

The welfare model analyses the determinants of household per capita expenditure using the following multiple regression model:

$$\text{Log } PCE = f(\mathbf{X}, \mathbf{Y}, \mathbf{Z}),$$

where PCE is mean per capita household expenditure and the other variables denote vectors of personal characteristics (\mathbf{X}) of the household head, other household characteristics (\mathbf{Y}) and community variables (\mathbf{Z}). If the relationship is assumed to be approximately linear, the equation to be estimated is of the form:

$$\text{Log } PCE = \beta_0 + a_1X_1 + \dots a_nX_n + b_1Y_1 \dots b_mY_m + c_1Z_1 + \dots c_jZ_j + \varepsilon.$$

The error term ε is assumed to be normally distributed with zero mean and constant variance, and uncorrelated with the explanatory variables.

5.2 Poverty model

The second model focuses directly on poverty, that is, whether the household is judged to be below or above the poverty line. The probability of being poor is specified as the value of the cumulative distribution function, which in turn depends on exogenous explanatory variables:

$$\text{Prob}(\text{Poor} = 1) = F(Z) = F(\beta_0 + \beta_1\mathbf{X}),$$

where $F(Z) = e^Z / (1 + e^Z)$ is the cumulative logistic distribution, representing the probability of being poor. \mathbf{X} represents the vector of

explanatory variables, which include personal characteristics of the household head, household characteristics and community variables.

5.3 *Explanatory variables*

The explanatory variables to be included are constrained by the available data. Only information about the characteristics of the household head was available, so other relevant factors were necessarily omitted. Personal characteristics cover the age, education, gender and sector of employment of the household head. Household characteristics include household size, and community factors indicate location (rural or urban) and zone of residence.

The age of the household head influences household welfare. Welfare initially increases with age as the individual acquires more human capital, but income may fall at older ages with declining productivity and retirement. A negative relationship is therefore hypothesized between welfare and the square of age.

Education is expected to have a positive relationship with income, and therefore with welfare. Thus, a more educated household head lowers the probability that the household will be poor and tends to raise household welfare. Education dummies are used in the study – primary education, secondary education and tertiary education, with no education as the reference category.

The gender of the household head also influences household income and welfare. Labour market studies suggest that, because of their limited access to education, women tend to concentrate in low-paying jobs, especially in the informal sector. This suggests that female-headed households are more likely than male-headed households to be poor. A dummy was used (1 for male-headed households, 0 otherwise).

Household size affects household income and welfare via the dependency ratio as well as the number of workers in the household. With respect to welfare, a larger family size and a greater number of dependants increase the resources required to meet the needs of household members, and therefore increase the likelihood that the household will be poor. The employment sector (farming or non-farming) is included because there are variations in earnings between different sectors of the labour market. It is expected that household welfare is higher, and the probability of being poor lower, in non-farming households as well as in urban households. Zone of residence was also included because poverty levels varied between zones.

A Chow test can be used to determine if two or more datasets can be “pooled” together for purposes of regression analysis. For the welfare model, the restricted (pooled) regression was estimated for each year,

Table 10.4 Tests of “poolability” and predictive performance, 1980–1996

Tests	1980	1985	1992	1996
Predictive performance				
Sensitivity: percentage of poor correctly classified	20.73	45.06	41.64	76.01
Specificity: percentage of non-poor correctly classified	97.84	89.44	90.27	66.81
Percentage of sample correctly classified	88.35	74.97	74.67	71.90
Area under ROC curve	0.863	0.822	0.798	0.782
No. of observations (<i>N</i>)	10,280	9,317	9,697	14,395
<i>“Poolability” by gender</i>				
<i>F</i> -tests				
<i>F</i> *	15.604	4.16	2.76	10.949
<i>K</i>	13	13	13	11
Likelihood ratio test				
Chi ²	25.15	1.01	46.14	25.33
Prob > chi ²	.0000	.3151	.0000	.0000
<i>“Poolability” by year</i>				
	1980–85	1985–92	1992–96	
<i>F</i> -tests				
<i>F</i> *	147.234	–(76.433)	–(220.941)	
<i>K</i>	13	13	13	
Likelihood ratio test				
Chi ²	10,138.53	9,991.05	18,080.18	
Prob > chi ²	.	.	.	

Source: Author’s computation.

then separate (unrestricted) regressions were run for male- and female-headed households. The first null hypothesis to be tested was that there is no difference in the coefficients obtained for male- and female-headed households separately. The second hypothesis tested whether the data can be pooled across years. On the basis of *F*-tests at the 5 per cent significance level, the results (see table 10.4) show that separate functions should be estimated for male- and female-headed households and for each year.

For the poverty model, the logistic function was estimated and the log-likelihood ratio (LR) calculated for each survey year. After estimating the full model, which includes all the explanatory variables, a restricted model was estimated excluding the gender variable (gender of household head). The results for the LR test reported in table 10.4 show that separate regressions were justified for the 1980, 1992 and 1996 datasets, whereas the data for 1985 could be pooled for regression purposes.

Similarly, the test showed that separate regressions should be run for each year.

5.4 Tests of predictive performance

To test for the predictive performance of the poverty model, two STATA commands were used: *lstats* and *lroc*. The *lstats* command generates “sensitivity” and “specificity” ratios. “Sensitivity” measures the fraction of observations with positive outcomes that are correctly classified, and “specificity” measures the fraction of observed negative outcomes that are correctly classified. The outcome was classified as positive if $\Pr(D) \geq 0.5$, where the true D was defined as poor = “0”. The *lroc* estimates the area under the ROC (receiver operating characteristic) curve. The curve is a graph of “sensitivity” versus one minus “specificity”. The area beneath the curve is used as a measure of the predictive power of the model. A model with no predictive power has area 0.5, whereas a perfect model has area 1.0. The results are shown in table 10.4.

6 Results of multivariate analysis

6.1 Determinants of household welfare

Table 10.5 presents the results of the determinants of household welfare, using log of real per capita household expenditure as the dependent variable. In 1980, welfare initially increased with age, but declined eventually at older ages as hypothesized (although age-squared is only marginally significant). In subsequent years (1985, 1992 and 1996), welfare first declined with age and then increased at older ages. The association is statistically significant in 1985 and 1996 but insignificant in 1992. This unexpected result may be owing to the high levels of unemployment and retrenchment of younger workers during the structural adjustment period.

With respect to education, in 1980, when poverty levels were low, education was an insignificant determinant of household welfare. As poverty levels increased, from 1985 onwards, education became an important determinant of family welfare along with the level of income. As expected, household welfare was higher among urban dwellers than rural residents, owing to greater income-earning opportunities in urban areas. The zone of residence was also correlated with family welfare, with most of the zones being better off than the reference zone (the northeast) for all survey years.² As regards the sector of employment, household

Table 10.5 Determinants of household welfare: All households, 1980–1996

Variables	1980	1985	1992	1996
Constant	8.371*	8.031*	7.796*	7.391*
Age	0.0013	−0.019*	−0.004	−0.006*
Age-squared	−0.00005	0.0002*	0.00004	0.00007*
Primary	0.010	0.049	0.059*	0.177*
Secondary	−0.033	0.056*	0.170*	0.249*
Tertiary	−0.059	0.309*	0.353*	0.427*
Urban	0.098*	0.059*	0.101*	0.165*
Northwest	0.086*	0.151*	0.348*	0.067*
Central	−0.043*	0.086*	0.082*	0.179*
Southeast	0.479*	0.462*	0.153*	−0.153*
Southwest	0.238*	0.134*	0.042	—
Southsouth	0.516*	0.216*	0.098*	—
Farming	−0.223*	−0.118*	−0.066*	−0.035*
Household size	−0.171*	−0.098*	−0.143*	−0.152*
Male	0.204*	−0.012	0.199*	0.098*
Adj R^2	.465	.347	.404	.294
F	642.96	354.99	504.83	501.31
Prob > F	.0000	.0000	.0000	.0000
Root MSE	0.7117	0.6629	0.7427	0.7082
N	10,280	9,317	9,682	14,395
Joint F -test—education				
F	1.73	43.76	22.93	69.73
Prob > F	.158	.0000	.0000	.0000

Source: Computed from FOS data on consumer expenditure surveys.

Note: * significant at 5 per cent level.

welfare was lower in households whose heads were in farming occupations compared with those in non-farming occupations. The association was more significant in 1980 when poverty levels were very low.

For all survey years, household size exerted a strong negative influence on household welfare. The association was highly significant. Household size has the highest level of significance of all the explanatory variables, suggesting that large households are likely to be poor. With respect to the gender of the household head, per capita expenditure tended to be lower in female-headed households in all years except 1985. This suggests that, after controlling for other variables, female-headed households are worse off than male-headed households despite their lower headcount poverty figures in 1985, 1992 and 1996. Multivariate analysis therefore suggests that age, education, urban residence, sector of employment, household size and gender of household head are important correlates of household welfare in Nigeria.

Table 10.6 Education as a determinant of household welfare: Male and female heads, 1980–1996

	1980	1985	1992	1996
<i>Male heads</i>				
Primary	0.012	0.032	0.048	0.156*
Secondary	−0.049	0.048*	0.132*	0.219*
Tertiary	−0.057	0.287*	0.315*	0.402*
Joint <i>F</i> -test—education				
<i>F</i>	1.73	43.76	22.93	69.73
Prob > <i>F</i>	.156	.000	.000	.000
Adj <i>R</i> ²	.4779	.3496	.3297	.2977
<i>F</i>	649.94	327.60	312.14	476.94
Prob > <i>F</i>	.0000	.0000	.0000	.0000
Root MSE	0.707	0.659	0.782	0.700
<i>N</i>	9,216	7,901	8,224	12,390
<i>Female heads</i>				
Primary	0.00005	0.150	0.129*	0.279*
Secondary	0.071	0.106	0.408*	0.392*
Tertiary	−0.1201	0.472*	0.495*	0.463*
Joint <i>F</i> -test—education				
<i>F</i>	0.43	14.64	12.61	24.98
Prob > <i>F</i>	.733	.000	.000	.000
Adj <i>R</i> ²	.3883	.3245	.3835	.3116
<i>F</i>	51.27	53.29	70.70	83.45
Prob > <i>F</i>	.0000	.0000	.0000	.0000
Root MSE	0.740	0.567	0.785	0.729
<i>N</i>	1,064	1,416	1,456	2,005

Source: Computed from FOS data on consumer expenditure surveys.

Note: * significant at 5 per cent level.

Table 10.6 looks in more detail at the education variables, reporting the coefficients of education variables in separate regressions for male-headed and female-headed households. The results for male- and female-headed households are generally similar to the results for all households combined. In 1980, education was not an important factor in either male- or female-headed households. In subsequent years, education increased household welfare, especially in 1992 and 1996.

In summary, the analysis suggests that the main influences on household welfare in Nigeria are education, rural/urban residence, the main economic activity (farming or non-farming) and household size. The directions of influence were generally similar for both male- and female-headed households.

Table 10.7 Determinants of poverty: All households, 1980–1996

Variables	1980	1985	1992	1996
Constant	−3.347*	−2.582*	−1.329*	−1.131*
Age	0.003	0.024*	−0.008	0.00002
Age-squared	0.00006	−0.0002*	0.00006	−0.00002
Primary	−0.214*	−0.002	−0.103	−0.443*
Secondary	0.069	−0.373*	−0.399*	−0.624
Tertiary	0.222	−0.974*	−0.857*	−0.993*
Urban	−0.214*	−0.169*	−0.215*	−0.426*
Northwest	−0.139	−0.466*	−1.204*	−0.125*
Central	−0.001	−0.194*	−0.427*	−0.442*
Southeast	−1.039*	−1.335*	−0.667*	0.376*
Southwest	−0.634*	−0.242*	−0.314*	—
Southsouth	−1.303*	−0.414*	−0.539*	—
Farming	0.673*	0.245*	0.170*	0.111*
Household size	0.352*	0.375*	0.335*	0.462*
Male	−0.608*	−0.079	−0.513*	−0.301*
LR χ^2	1,917.56	2,558.02	2,368.05	3,578.70
Prob > χ^2	.0000	.0000	.0000	.0000
Pseudo R^2	.2502	.2174	.1946	.1808
Log-likelihood ratio	−2,873.354	−4,603.380	4,899.963	−8,106.504
N	10,280	9,317	9,697	14,395
Joint test—education				
χ^2	7.43	100.40	50.63	160.73
Prob > χ^2	.0595	.0000	.0000	.0000

Source: Computed from FOS data on consumer expenditure surveys.

Note: * significant at 5 per cent level.

6.2 Determinants of household poverty

Table 10.7 presents the results of the logistic poverty regression for all households, and table 10.8 reports the education variable for male- and female-headed households treated separately. The results for the poverty equations are similar to those for household welfare. A higher level of education and urban residence reduced the likelihood of the household falling into poverty. Male-headed households were also less likely than female-headed households to be poor. In contrast, large households and male-headed farming households are more likely to be poor. Urban residence was more significant for male-headed households. Female-headed farming households are less likely to be poor than non-farming households, but the association is significant only for 1996, when the incidence of poverty was very high among all households in Nigeria. This corroborates table 10.2, which showed that women in sales occupations

Table 10.8 Education as a determinant of household poverty: Male and female heads, 1980–1996

	1980	1985	1992	1996
<i>Male heads</i>				
Primary	−0.179	0.022	−0.077	−0.392*
Secondary	0.139	−0.307*	−0.313*	−0.524*
Tertiary	0.271	−0.824*	−0.794*	−0.891*
LR χ^2	1,735.49	2,122.00	1,993.41	3,057.56
Prob > χ^2	.0000	.0000	.0000	.0000
Pseudo R^2	.2513	.2096	.1919	.1803
Log-likelihood ratio	−2,585.058	−4,000.938	−4,078.602	−6,949.388
N	9,216	7,901	8,237	12,390
<i>Female heads</i>				
Primary	−0.615*	−0.054	−0.269	−0.637*
Secondary	−0.607	−0.915*	−1.059*	−1.101*
Tertiary	−0.567	−2.497*	−0.916*	−1.316*
LR χ^2	215.13	477.78	455.22	540.84
Prob > χ^2	.0000	.0000	.0000	.0000
Pseudo R^2	.2839	.2804	.2560	.1950
Log-likelihood ratio	−271.381	−574.568	−661.342	−1116.154
N	1,064	1,416	1,459	2,005

Source: Computed from FOS data on consumer expenditure surveys.

Note: * significant at 5 per cent level.

(where women, especially urban women, predominate) have become poorer over the years.

6.3 Discussion of findings

The multivariate analysis has shown that, after controlling for all relevant variables, female-headed households are more likely than male-headed households to be poor. The application of Chow's test to the welfare model and the likelihood ratio test to the poverty model (see table 10.4) justified the estimation of separate equations for male- and female-headed households and separate models for each year. However, the likelihood ratio tests support the estimation of a "pooled" model for 1985. Important determinants of household welfare in female-headed households are education, household size, rural residence and main occupation. Thus, the higher is the education level of the head, the greater is household welfare and the lower is the probability of the household being poor, whereas a larger household size lowers family welfare and raises the likelihood of poverty. Joint tests for education showed that, although education was not a significant determinant of either household

welfare or poverty in 1980, it was significant for all other years. Rural households were more likely to be poor, although women in non-farming occupations were highly likely to be poor. Tests of predictive performance showed that the poverty model performed fairly well in classifying households as poor or non-poor. Except for 1996, however, it was more successful in classifying non-poor than poor households correctly.

The findings reported in this chapter suggest that efforts to reduce female poverty in Nigeria should focus on increasing women's access to education and other productive resources as well as on reducing family sizes. Studies of women's access to education, female labour force participation and fertility behaviour in Nigeria also underscore the importance of female education for the feminization of poverty. They show that:

- Women's education influences employment options in the labour market. It is negatively and significantly related to participation in the informal sector; that is, educated women were less likely to be employed in the informal sector (Okojie, 1989/90, 1990).
- Education is a positive and highly significant determinant of women's incomes; the higher the level of educational attainment, the higher the level of income (Anyanwu, 1996).
- The mother's education is important for her daughters' educational attainment; the higher the mother's education, the less likely that her daughters drop out of school and the more years her daughters spend in school (Okojie, Chiegwe and Okpokunu, 1996).
- Female education increases contraceptive use levels and leads to lower fertility (Okojie and Okojie, 1997).

An important strategy for reducing poverty in Nigeria, therefore, is to increase women's access to education. Not only will this increase their incomes and improve household welfare, it will also reduce the inter-generational transmission of poverty to daughters and their families. However, increased access to education has to be accompanied by policies to increase women's access to other productive resources such as land, agricultural inputs, credit, information and markets. Poverty reduction strategies in Nigeria should be engendered to ensure that women are the targets and beneficiaries of poverty alleviation programmes.

7 Education, poverty alleviation programmes and women in Nigeria

7.1 Poverty alleviation programmes

Since independence, successive governments of the federation have embarked on various programmes to provide basic social and economic

services aimed at improving the quality of life of Nigerians. In general, these programmes fall into two categories (Aliyu, 1999):

1. programmes with mandates relevant to poverty alleviation, and
2. core poverty alleviation programmes through investment promotion in micro and small business enterprises.

Several programmes that had mandates relevant to poverty alleviation were designed and implemented in Nigeria. These programmes aimed to provide various services to enhance the productivity, incomes and welfare of the poorest segments of the society. They were merely palliatives, however. In the absence of a poverty line for Nigeria, they were not precisely targeted to deserving beneficiaries. A majority of the poor did not benefit from these programmes, and women were the most marginalized. Since the late 1980s, however, programmes targeting poverty more directly have been designed and implemented, including those targeted at women. Currently, a new programme, the National Poverty Alleviation Programme, a component of which is the Youth Empowerment Scheme, is being implemented.

In general, although some achievements have been recorded, the escalation of poverty in Nigeria shows that the various strategies and programmes were inadequate to fight poverty. Women benefited only marginally from government poverty alleviation programmes, many of which have been disbanded or merged. A major reason women did not benefit significantly from these programmes was because women were not identified as specific target groups in most government programmes; they were therefore crowded out by male beneficiaries. Where women were a target group – in, for example, the Better Life Programme and the People's Bank of Nigeria programme – women have benefited.

7.2 Women and education in Nigeria

In Nigeria, efforts are being made to promote women's access to education. In 1986, the Blueprint on Women's Education in Nigeria was launched. This was followed by the establishment of women's education units in federal and state ministries of education. Non-governmental organizations and donor agencies such as the United Nations Children's Fund, the United Nations Educational, Scientific and Cultural Organization, the United Nations Development Programme and the British Council have also been involved in promoting women's education. Despite all these efforts, progress in reducing the gender gap in access to education has been slow. Available data show that, at the primary school level, equality of access has been more or less achieved. However, wide gaps still exist at the secondary and tertiary levels. One of the factors restricting access to education in Nigeria is poverty. In poor households,

girls are more likely to be denied access to education, especially beyond primary education.

8 Conclusion

This chapter examined the linkages between the gender of household head, education and household poverty and welfare in Nigeria between 1980 and 1996. Two models were estimated, a welfare model and a poverty model. The welfare model estimated an ordinary least squares regression of the determinants of mean per capita household expenditure. In the poverty model, a logit regression of the probability of the household being poor was performed. Tests for the “poolability” of datasets for male- and female-headed households and for different years were carried out using the *F*-test for the welfare model and the likelihood ratio test for the poverty model. Neither test supported the pooling of the datasets, except the poverty model for 1985. Separate regressions were run for male- and female-headed households, although only the education coefficients were reported. Tests of the predictive performance of the poverty model were also done for all survey years.

Multivariate analysis showed that, after controlling for other individual and household characteristics, female-headed households were more likely to be poor. Education and household size exerted significant influences on household welfare and the probability of being poor. A higher educational attainment of the head tended to raise household welfare and to lower the likelihood of the household falling into poverty. This was confirmed by joint *F*-tests of the education categories. Education was, however, not significant in 1980, when the level of poverty was low. A larger household size reduces household welfare because of the higher dependency burden resulting from high fertility levels. The two variables – education and household size – remained significant when separate regressions were run for male- and female-headed households. Rural/urban residence and the occupation of the head also influenced household welfare and the probability of being poor. These findings suggest that policy attention should be directed at increasing female education and reducing fertility levels to reduce household size.

A review of past efforts to alleviate poverty in Nigeria showed that women benefited minimally from such efforts. Most of the programmes did not target women specifically. There is a need to mainstream women into poverty alleviation and education programmes in Nigeria to ensure that women benefit from them.

Notes

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1. Calculations (not reported) for the poverty indices other than the headcount measure show that the depth and severity of poverty were higher in female-headed households in 1980 and 1992, whereas male-headed households experienced greater depth and severity of poverty in 1985 and 1996.
2. This was supported by joint *F*-tests for zone.

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