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## **Non-Financial Corporate Risk Management and Exchange Rate Volatility in Latin America**

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### **Abstract**

This article studies the currency risk management of multinational companies with investments in Latin American countries. The analysis is centred on episodes of currency or financial shocks, searching into the behaviour of the financial management of a firm expecting a significant devaluation. This allowed us to explore the interaction and transmission mechanisms between the microeconomic behaviour and the macroeconomic impact on the foreign exchange market. The analysis was carried out interviewing financial managers of multinational companies from different sectors with headquarters in the United Kingdom and Spain, by reviewing literature on business and currency risk management, and by analysing some surveys on financial risk management in developed countries.

**Keywords:** foreign exchange, financial markets, international investments, capital movements

**JEL classification:** F21, F23, E22, G32, D8, D92

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## **Author's note**

The idea of examining the macroeconomic impact of currency risk management by multinational companies was suggested by Stephany Griffith-Jones, and this paper has benefited from stimulating conversations with her throughout its development.

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## Introduction

An important debate took place after the Tequila and the Asian crises in relation to the impact of capital flows volatility on investment and growth in developing countries. In policy circles – including policy-oriented academics – the discussion centred around the need for fundamental reforms on the international financial architecture.<sup>1</sup> Among academics, the studies were related to the impact of the different components of capital flows.

This paper will deal with the latter type of analysis, that is, the financial management of multinational companies with investments in Latin America. The study makes a distinction between the degree of reversibility of the physical investment originated in foreign direct investment and the flow of funds linked to it. The analysis is centred on episodes of currency or financial shocks, searching into the behaviour of the financial management of a firm expecting a significant devaluation. This allowed us to explore the interaction between the microeconomic behaviour and the macroeconomic impact on the foreign exchange market around the following questions:

- i) Is currency risk management of non-financial corporations affected by foreign exchange volatility and financial contagion?
- ii) Have the diverse exchange rate policies different effects over the cash flow management of multinational companies?
- iii) Can we identify a variety of micro-macro transmission mechanisms between currency risk management and the foreign exchange market?

The analysis was carried out in the following way: (a) interviewing financial managers of multinational companies from different sectors, with investments in Latin America and headquarters in the United Kingdom and Spain, (b) by reviewing literature on business and currency risk management, and (c) by analysing some surveys on financial risk management in developed countries.<sup>2</sup>

Sixteen financial managers were interviewed from twelve multinational companies. These included the mining, oil and gas industries, the energy and telecommunications sectors; the food industry, and financial corporations. Four of these companies are among the ten firms with biggest sales in the region and all of them have had the highest volume of foreign direct investment in Latin America over the last five years.

As a complement to the research, financial managers of multinational subsidiaries were interviewed in Chile. Four reasons were considered to choose this country: (a) Chilean experience was considered paradigmatic after economic reforms, (b) it had a very stable economic regime (c) has good country risk qualifications and (d) the financial system is relatively developed.

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<sup>1</sup> See Ocampo (1999, 2000), Griffith-Jones and Ocampo (1999), Goldstein (2000), among others.

<sup>2</sup> Wharton School and Gundy (1996), World of Banking (1995).

As the analysis and the conclusions are not based on statistical samples and we do not have answers, which could be scientifically tested, this study must only be considered a first essay on this subject and an incentive for further research.

## 1 Foreign direct investment and capital flows volatility

During the 1990s, foreign direct investment in Latin America and the Caribbean rose, from an annual average of 6 billion dollars at the beginning of the decade, to 85 billion dollars in 1999. Eighty per cent of that amount was concentrated in four countries: Argentina, Brazil, Chile and Mexico.

The observed foreign direct investment (FDI) and capital formation maintained a strong relation during the last two decades (French-Davis and Reisen 1998), but an important percentage of foreign direct investment during 1999 and 2000 came from mergers, acquisitions and privatizations. ECLAC (2001) estimated an accumulate figure in the range of 90 billion dollars in two years, which represents half of the total amount of foreign direct investment in that period. Most of that investment was oriented to infrastructure, in particular the telecommunication and energy sectors.

Comparing the decade of the 1980s with the 1990s, we can find that foreign direct investment in Latin America was persistently less volatile than net capital transfers<sup>3</sup> (see the standard deviation/average of the series in Table 1). These results are consistent with the study made by Sarno and Taylor (1999), who conclude that FDI has a very significant estimated permanent component, suggesting that it is more sensitive to the long-term structural forces relating to a country's economic performance than other forms of financing. Hausmann and Fernández Arias (2000a, b) and Lipsey (2001), also conclude that FDI liabilities seem to be safer (in the sense of less crisis prone) than debt or other forms of non-FDI obligations.<sup>4</sup>

Table 1  
Latin America: FDI and net capital transfers volatility  
(Coefficient of variation %)

	1980–1985	1986–1989	1990–1995	1996–1999
Direct foreign investment	0.22	0.35	0.50	0.23
Net capital transfers	1.51	0.24	1.45	1.31

Source: ECLAC, Balance of payments of 19 Latin American countries.

<sup>3</sup> The exception was the second-half of the 1980s, when short term capital and loans did not come to the region.

<sup>4</sup> All the studies contrast with Claessens, D>ws, but with observations coming from few countries (Claessens et al. 1995).

However, multinational companies were always aware of currency volatility. During the 1960s, 1970s and 1980s, the problem was caused by commodities price shocks, inconsistent macroeconomic policies and high inflation rates – in some cases hyperinflation. They address these problems by accelerating the remittance of dividends and depreciation reserves. With the opening of the capital market and with financial globalization, multinational companies increased debt financing. This was stimulated by the revaluation of Latin American currencies that prevailed during 1990–1997 (Ffrench-Davis 2001).

Foreign debt exposure depends on the financial strategy of the multinational company, the macroeconomic domestic and international environment and among other factors, the business sector in which it is located. In the case of Chile, the statistics from the Foreign Investment Committee shows that in the mining sector, 70 per cent of total foreign direct investment comes from loans provided by headquarters or the international financial system, while in manufacturing the figure is only 22 per cent. In the case of the public service sector, at the beginning of the nineties firms had a very low level of debt in foreign currency while the share increased fast during the rest of the decade. Financing with foreign loans was in some countries, among them Chile, encouraged by tax benefits.

## **2 Foreign exchange risk management of multinational firms**

Even though financial and currency risk management has become a fundamental matter for business administration during the last 10 to 15 years, multinational firms in developing countries were used to manage risk exposure long before that. It must be remembered that Latin American countries were very unstable with extremely high rates of inflation and currency crises were frequent. Matching assets and liabilities in the same currency, so that a payment and receipt in a particular currency could be offset was the most common mechanism for dealing with foreign exchange risk.

Another mechanism still in use is the portfolio approach. This mechanism, in which the firm manages a great diversity of current flows, itself provides protection against currency risk. But it implies geographical diversification of business, lack of dependence on any one-business area, and geographical diversification in operations and sources. This is the case of multinational companies with a large variety of goods and businesses in different regions and different countries like the chemical and pharmaceutical industries, food, beverage and other manufacturers.

Thanks to the development of the international financial system, during the eighties and over an ascendant trend during the 1990s, most multinational companies put into practice new risk management instruments-swaps, forward contracts and options, the so-called derivatives – to deal with currency risk exposure.<sup>5</sup> But which is the specific policy management of multinational companies in relation to foreign exchange risk? Is there an optimal currency risk management?

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<sup>5</sup> See Davis et al. (1991), Stern and Chew (1998), Guay (1999), Prevost et al. (2000) and Bartram (2000) for an analysis of currency risk management in non-financial corporations.

## 2.1 A typology of financial strategies in currency risk management

There is no single accepted framework, which can be used to guide hedging strategies. As Froot et al. (1993) signalled in the early-1990s, there are multiple solutions to optimal hedging by multinational firms. A firm's optimal hedging strategy – in terms of the amount of hedging and the instruments used – depends on the nature of the investment, the financing opportunities, the nature of the product, the degree of market competition and also on the hedging strategies adopted by its competitors. Therefore, determining whether a hedging strategy of a firm is appropriate, is a very complex question.

In the real world we find enterprises having neutral, averse or active management policies. Even if they are risk reluctant there may exist circumstances in which matching currencies between incomes and liabilities is impossible or instruments for hedging are so expensive that the firm prefers to have some exposure to risk. So we are going to consider as a stylized fact, that enterprises always have some percentage of risk exposure. But hedging strategies are different between firms. For the purpose of our analysis, this paper develops a typology of financial strategies, classifying firms by degree of risk exposure, which depends on market orientation and diversification.

### 2.1.2 *Multinational companies in the export sector*

In ascending order (from lesser to higher degree of risk exposure) are the multinational companies who deal with commodities, mineral oil and gas, wood pulp, fish-meal, and subsidiaries in the export processing zones (assembly plants). In general, their investments are financed with equity (FDI) and loans in foreign currency and they match interest services, and remittances of dividends with income in the same currency, so they are naturally hedged.<sup>6</sup> (Box 1)

### 2.1.3 *Multinational companies that are regionally and geographically diversified*

In order of degree of currency exposure, next come multinational companies with their production oriented to the local market, but with investments in many countries and different regions. We find these companies in every branch of the manufacturing sector. While the earnings are obtained in local currency, liabilities as short term and long term loans are paid mainly in foreign currency. These firms face principally two types of currency risk exposure.

The first one is economic risk. In business literature, and also among managers, it is difficult to find a single definition of it. The concept in general is related with the impact of a devaluation on the present value of the future earnings of the firm. It is very difficult to measure this concept, because it depends on the reaction of the competitive context of the firm and the effect of the currency shock over competitors and customers. As can be seen in Table 1, managers rarely hedge this type of risk.

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<sup>6</sup> Because of the nature of their business, several multinational companies also hedge commodity price risk, using commodity price derivatives over an important portion of their projected output. As examples, we have the case of the North American gold mining industry where the firms hedge over 26 per cent of their production on average (Bartram 2000).

Box 1  
Currency exposure in the mining sector

Investments in the mining sector (metallic minerals, oil and gas) are predominantly done by project finance. A main characteristic of this type of funding is that the guaranty is the quality of the project. The loan is paid by a long term contract, with the gross earnings of the project it self. In some cases, the mining companies entered into payment arrangements with output instead of issuing ordinary debt. A bank provides cash up-front and the company undertakes to deliver the output to the bank and arranges for the output to be repurchased at a guaranteed price.

The second characteristic is that mining corporations before investing, always ask for and obtain from the host country full guaranties of no variability of investment conditions, freedom of capital and commercial management, especially in regards to loans payments. They can operate with an 'escrow account' abroad, in which the corporation has the right to deposit the export proceeds, and from that account, without inflow into the country, can pay interests and mortgages of the loans.

Both characteristics are related to the long maturity of mining investment. The result is that entrepreneurs and bankers, at the moment of investing, have built a protective umbrella in face of financial crises. If the project produces sufficient mineral, they will be able to sell it in the international market, receive the income abroad, pay the foreign loans and all of this will be independent from the economic evolution of the host country.

Because of the risk aversion in developing countries, mining corporations manage a minimum of their liquid funds inside the host country. The headquarters of the corporation choose an optimization of interest rate, risk and tax exposure to make their financial investment and it is always done outside the emergent country in which they have their investments.

In the opposite site of the cycle, some companies were induced to hedge the amount of expected costs, introducing derivatives to their currency risk management, but this was not a general case. Devaluations occurred after the Tequila and the Asian crises brought benefits to these firms, because the cost of salaries and other local inputs in terms of strong currencies (yen, mark, pound or euro) decreased.

Source: Author, based on interviews with multinational companies in the mining sector.

The second one is the transaction risk exposure, which is easier to measure and to hedge. Transaction exposure or cash flow exposure concerns the actual cash flow involved in settling transactions denominated in foreign currency. Table 2 shows that the 49 per cent of US firms and 34 per cent of Germans hedge because of this concept.

In our study, multinational companies having business in many countries and regions informed that they always hedge against transaction exposure but they very seldom hedge balance sheet account or translation exposure, that is the impact of currency

volatility in the value of assets and liabilities. They have at least two reasons for this policy: the first is that devaluation in one country could be compensated with revaluation in another. The second is that in the very long term, assets and net worth would not be affected by currency volatility because exchange rate movements mainly depend on productivity.

#### 2.1.4 *Multinational companies with investments concentrated in one region*

On the other hand, multinational companies, who concentrate investments in few countries or in one region and produce for only foreign or domestic markets, usually take balance sheet exposure into consideration. The exposure arises from the periodic need to report consolidated world-wide operations of a group in one reporting currency. In this case, they try to finance investments in the domestic financial system as much as they can, or in a basket of currencies that are highly correlated with the local currency in the long run. They also hedge with derivative instruments translation and transaction risk: debt, expected dividends and cash flow movements as shown by studies made in developed countries (Davis et al. 1991, Guay 1999, Prevost et al. 2000 and Bartram 2000).

#### 2.1.5 *Multinational companies in public services*

With the privatization of public services (telecommunication, electricity, water and sanitation, roads and ports) new multinational companies came to Latin America. These companies could be defined as being the most exposed to currency risk volatility, because they obtain their income in the local market, and demand huge investments which local financial systems cannot afford. So if they have a risk adverse policy, they have to make financial hedging.

Some multinational companies – natural monopolies operating in regulated markets – have negotiated tariffs fully indexed to the domestic price of the dollar. In other cases, there is partial indexation. For instance, because inputs, such as gas and oil are denominated in this currency, as well as for reposition of the assets or the cost of expansion (imported machines like electric power plants, water treatment plant, telecommunication equipment, computer and information technology, are always imported from industrial countries).

Table 2  
Most important objective of hedging strategy  
(%)

	Accounting earnings	Cash flows	Balance sheet accounts	Economic risk Firm value
USA	44	49	0.9	8
Germany	55	34	7.4	12

Source: Bodnar and Gebhardt (1998).



Within this group there are different kinds of currency risk strategies. Some firms are very conservative and have a centralized risk policy. The subsidiary reports financing movement to its headquarters who hedge *'the maximum of the level of exposure'*. Other strategies set *'a global limit of risk exposure such as one year's total earnings'*. There is also the case of public service multinational corporations who are highly indebted in foreign currency and businesses concentrated in one region. For them, translation risk is the main purpose for hedging. The risk of a step devaluation could imply a sharp rise of the level of indebtedness and a consequent loss in the value of the firm.

The conclusion of this section is that the degree of risk exposure depends not only on the magnitude of indebtedness but also on market orientation and diversification of the firm. In some cases, as with export firms, they do not use hedging at all, for them the cost is greater than the benefit of hedging. For other multinational companies, such as firms oriented to the local market, with large foreign currency debts, the demand for derivatives is very high. In this case, instruments in the derivative market became a necessary input for financing management, being an indispensable factor for smoothing interest and foreign exchange rate fluctuations.

## **2.2. Statistics in derivative markets**

Comprehensive global statistics concerning derivative instruments are available from the Bank of International Settlements (BIS). This institution measures the trading volume (turnover in number of contracts) and the notional amount outstanding (in US dollars) of derivatives, differentiating by type of instrument. The notional amount is a reference of cash flows under individual contracts and provides a rough indication of the potential transfer of risk associated with them.

Press releases from BIS<sup>7</sup> show that during the period 1995–June 1998, the total amount of derivatives increased very fast, at a global rate of 14 per cent per year. Then, in the six-month period, between June and December 1998 – in the middle of the Asian crisis – interest rate instruments had an explosive rise while foreign exchange contracts began to descend. This was also the case with non-financial customers. The dynamic of the market during the following years continued to be led by interest rate instruments while foreign exchange contracts maintained a moderate upward trend.

The international financial market offers a broad variety of derivative instruments for foreign exchange risk management (Dodd 2002). This includes 'plain vanilla' instruments such as forwards, swaps, or futures, or highly sophisticated structures of derivatives consisting of combinations of derivative instruments (e.g. collars and swaptions), and hybrid debt with embedded derivatives.

Although companies have been using derivatives for many years, little is known about the extent or pattern of their use; this is because firms have not been required – until recently in the US – to publicly report their derivative activity. Corporate annual reports (balance sheet and off-balance sheet reports) when available, may be confusing. First, because the figures correspond to accounting periods rather than to the economic events in which we are interested. Second, because the financial exposure or hedging transactions of subsidiaries are not always reported by multinational companies.

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<sup>7</sup> See BIS Press release June 1998, 13 November 2000 and 16 May 2001.

Table 3  
Most important instruments in the derivative market  
(%)

	OTC Forwards	Futures	OTC swaps	OTC options	Exchange traded options	Structured derivatives	Hybrid debt
USA	56.8	8.0	9.1	18.2	1.1	6.8	1.1
Germany	75.5	4.3	13.8	18.1	0.0	1.1	0.0

Source: Bodnar and Gebhardt (1998).

We dealt with this problem by basing our analysis on interviews with the treasurer or the financial managers of large firms with business in Latin America.<sup>8</sup>

One of the findings of our interviews is that firms investing in Latin America coincided with those of US and German firms in their preferences for simple foreign exchange instruments, that is, the use of over-the-counter (OTC) instruments like forwards, swaps and options (Table 3). They make negotiations with the main banks of the international financial market, such as Citibank and Chase Manhattan, Spanish banks such as Santander and BBVA, other European banks and also investment banks like Merrill Lynch and Morgan Stanley. They negotiate with local banks only in special cases where small amount of liabilities need to be covered. Specific analysis of hedging policy of firms in Latin America is developed in the next section.

### 3 Hedging policy in Latin American countries

In their reports, multinational companies assert that their currency risk policy is oriented to hedge their financial risk exposure and not to make speculative movements and gains with it. Executives insist that the main purpose of the treasurer is to support the business of the company, which is to make earnings producing goods and services. This is the policy which shareholders approved. They indicate that the best way to do it is for keeping a fairly stable financing or interest rate regime, and that is the reason to make contracts in the derivative markets. This statement was confirmed by the studies of Stulz (1996) and Fite and Pfleiderer (1995) who conclude that corporate risk management results in a reduction of corporate cash flows volatility, which at the same time leads to a lower variation of firm value.

Non-financial corporation managers also indicated that during the last decade, in order to avoid unexpected scenarios in Latin American countries, their companies developed teams for country and regional macroeconomic analysis and managed foreign exchange rate economic models. They also study the information coming from international agencies and investment banks.

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<sup>8</sup> Interviews were made to financial managers in firms with headquarters in the United Kingdom and Spain and from financial statements quarterly reported by multinational enterprises to the United States Securities and Exchange Commission (Form 20-F).

But bankers have another point of view. In the case of Chile, those interviewed argue that financial managers have an active foreign exchange risk management (maintaining open positions) which they interpret as a speculative management. They deduce this from the short period for which firms take derivatives. In this case they are exposed to the movements of the 'base risk' (the difference between the spot price of the asset to be hedged and the future price of the contract used) and in the difference between the domestic and the international rate of interest.

The answer of financial managers of subsidiaries of non-financial corporations is that the concentration of the market in few operators and the low development of the Latin American derivative markets do not allow them to make an optimal management. This is what we are going to analyse in the next section.

### **3.1 The Latin American derivative market**

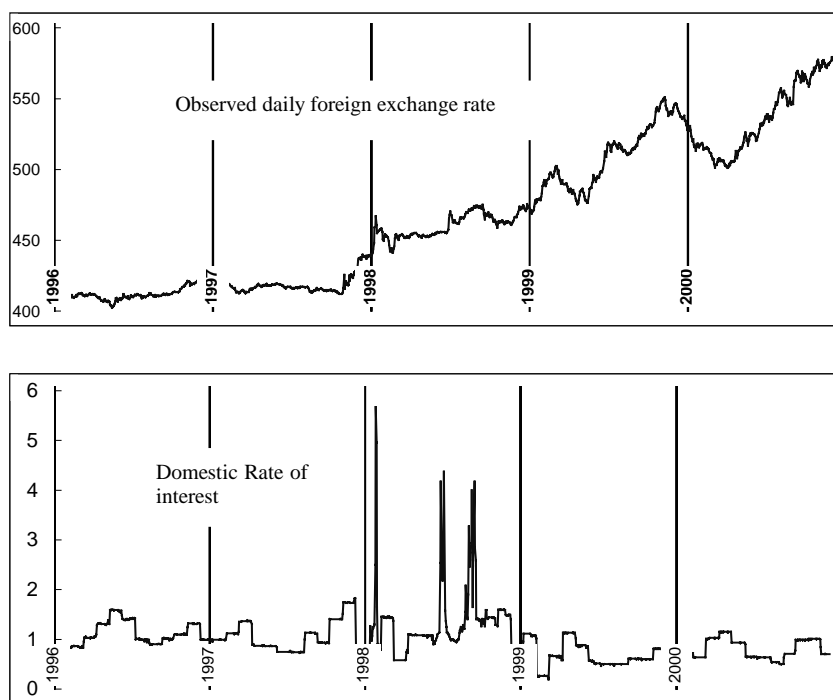
Multinational companies in Latin America try to negotiate derivative contracts in the local markets where they find instruments at a lower cost. However they face some restrictions because these markets have not been developed until recently – between two and five years ago in most cases. One of the incentives for their creation was the huge investment made by multinational companies since the privatization of public services. The process began with the arrival of multinational companies and their investments, followed by the demand for foreign currency loans and the consequent demand for derivatives to protect them from currency risk.

With the exception of Brazil, the institutional framework for derivatives in Latin America is still very weak. As an example, non-delivery forward contracts in the Chilean currency were not legalized in Chile until 2001. In the case of the Argentine market the legal framework is still in discussion in the Parliament and in Mexico a recent reform to the legal framework allowed local and international banks only in this year to be 'market makers'. Naturally, the derivative market has developed first into the USA market, principally in New York and Chicago.

Brazil has the most sophisticated derivative local market with all types of instruments, in which approximately 27 per cent of all derivatives today corresponds to US dollar futures. This participation increased greatly between 1991 where they account only 7 per cent of the total – and 1997 when they reached 36 per cent. In Mexico all types of OTC instruments can also be found, including foreign exchange rate options, securities, and swaps. For the Chilean currency, the daily negotiated amount of NDF in the New York market is of a range of 250 million dollars while in the local delivery forward market the sum is around of 600 million dollars. In the case of a thin market like Peru, only NDF contracts are made, while in Bolivia there is no derivative market at all.

According to multinational companies, the best way to manage financial risk in emergent markets would be with long-term contracts during a stable economic context, when instruments can be found at a lower cost. Making long term contracts is very important for the companies, especially if a step devaluation is expected during the following six or twelve months. The purpose is to make a bridge over the crisis period.

Figure 1  
Chile: Daily foreign exchange rate and interest rate, 1996–2001  
(Pesos per dollar)



Source: The author based on Central Bank of Chile statistics.

Table 4  
Forward contracts in Chile

	Forward peso/dollar Accumulated annual million dollars	Forward peso – dollar Maturity period		Forward UF/dollar Accumulated annual million dollars	Forward UF – dollar Maturity period		
		Until 42 days/total %	More than 42 days/total %		Until 90 days	Between 91 and 360 days	More than 360 days
1996	36334	98.9	1.1	11495	36.6	51.4	12.0
1997	96166	96.3	3.7	15885	33.4	50.9	15.7
1998	99377	97.1	2.9	13517	35.2	52.9	11.9
1999	101623	96.5	3.5	23889	38.4	46.7	14.9
2000	107872	94.5	5.5	31378	54.0	34.9	11.1

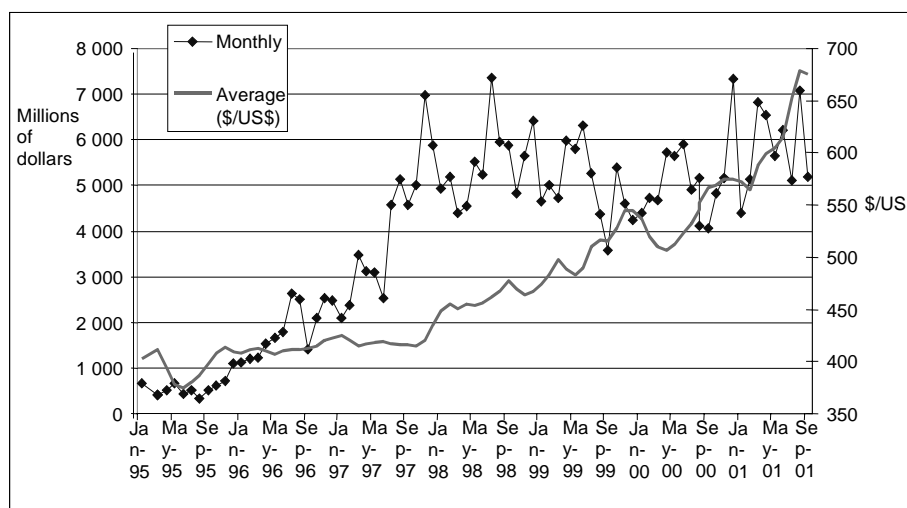
Source: Banco Central de Chile, Informe Económico y Financiero.

But non-financial corporation managers said that this is not always possible because instruments are normally available for only a few months.<sup>9</sup> In the case of Chile, for example, forward contracts market is liquid for 42 or 90 days, and only few enterprises can hedge for one year or more. They state that the reason could be the lack of a secondary market for long term instruments in the financial system. There are no ‘market makers’, and long term instruments are negotiated in the stock market. The enterprises have to wait until someone wants to negotiate a long-term instrument and set a price on it.

Statistics published by Central Bank of Chile are consistent with what multinational company managers said. The forward market during the last five years registered more than the 90 per cent of peso-dollar contracts belonging to periods less than 42 days, while a similar situation is observed with UF-dollar contracts (see Table 4). In the markets with maturity over 42 days, the daily average volume negotiated is 22 million dollars, which is a very small amount for transactions for multinational companies.

In Figures 2 and 3 we can observe the amounts and prices of forward contracts in Chile. The first figure shows the movement of the average of all peso-dollar contracts, in which short-term instruments predominate. During 1995 and 1996 the instruments began to be used, showing from the beginning and upward trend. During the Asian crises there was a dramatic increase and since then, the total amount negotiated each month oscillated between 5000 and 7000 thousand dollars. This behavior is coincident with the period of higher volatility of the exchange rate in Chile.

Figure 2  
Chile: total forward contracts with non-financial corporations

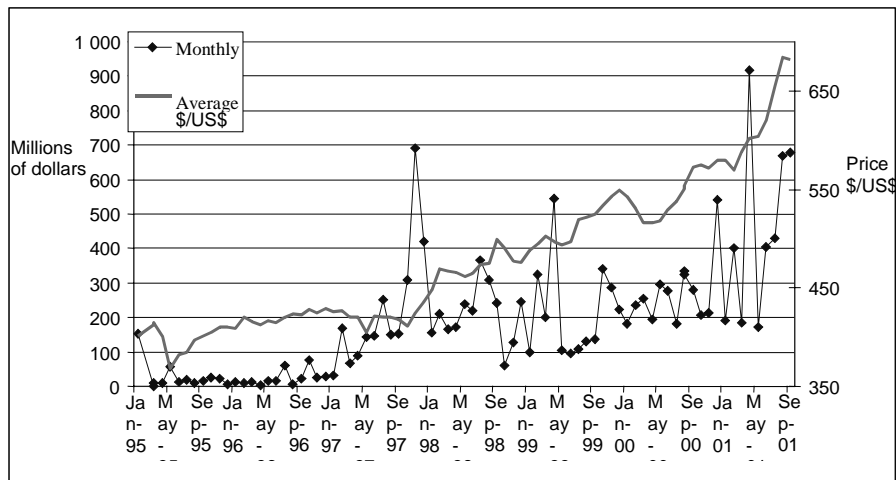


Source: Central Bank of Chile

<sup>9</sup> In the derivative markets of developed countries, the maturity was between three and six years before the financial crisis of the 1990s, but this range decrease after the Asian crisis up to 1–3 years.

Figure 3

Chile: forward contracts for more than 42 days with non-financial corporations



Source: Central Bank of Chile

It is also interesting to observe that for contracts of more than 42 days sizable demands occurred on only few occasions. One of the explanations is that long-term forward contracts are more expensive than short-term. In 2001, while in a short-term operation the spread is 30 cents, a one-year instrument has a spread of 3 pesos. Chilean bankers, argue that firm's financial managers are unwilling to bear that cost and prefer to be more exposed to basic risk, using short-term contracts which can be rolled over. According to the bankers, this is speculative management.

In order to qualify the above statements, it must be said that during turbulent periods, or when a financial external shock occurred, the possibilities of hedging via derivatives is more restricted and instruments are only available at very high prices.

The price of a forward contract (F) depends on the spot value of the exchange rate (S), the local interest rate ( $i_D$ ) and the international interest rate ( $i_X$ ):

$$F = S * (1 + i_D) / (1 + i_X)$$

While the international interest rate is more stable during a financial or currency crises, the value of the dollar in the spot market 'S' and the difference between the domestic rate and the international interest rate could rise substantially. Foreign exchange policy and monetary policy could contribute to increase the cost of the instrument. This was the case in Chile after the Asian and Russian crises. Between 1998 and 1999 we observed not only a strong devaluation but also a huge increase in the local interest rate (see Figure 1). This represents a serious problem for hedging. If the contract ended in the middle of a crisis, it would be impossible to make a roll over at a reasonable price. The cost of roll over could be more than the cost of the devaluation and the sum of losses could not compensate the use of the instrument.

Other examples are the cases of Argentina and Brazil. In the first country, during the last two years the financial markets expected the abandonment of the currency board. In

1999, the differential cost for hedging was 21 to 25 per cent yearly (this must be compared with 18 per cent in Brazil and 7 per cent in Chile in the same period). The expected volatility in the spot market increased the risk of hedging.

In the case of Brazil, during 1998 the Real was quoted in the forward market at 3 real per dollar when in the worst moment of the crisis it was no higher than 2.20 and after that it fell to 1.75. A hedging with a forward contract at 3 would imply a huge loss instead of a protection against devaluation.

The lack of sophisticated derivative instruments, the short period of the hedging contracts and the scarcity of liquidity are great disadvantages for national and multinational firms in Latin American countries. In addition to these problems, there is the absence of transparency and the asymmetry of information. As an example, in the case of Chile, the enterprises do not have access to the inter-banks and stock market prices of foreign currency. At the same time, the demand for hedging of some firms is very large in relation to the supply of foreign currency, so they have to go to the market using intermediaries to avoid banks incrementing artificially the cost of the derivative when they know from where the demand comes.

One conclusion of this analysis is that managers could have the intention to hedge currency risk exposure, but they are not prepared to pay a very high cost for it. This is the reason why the depth and development of the local financial markets are very important for non-financial multinational corporations. Another conclusion is that due to the fragility of Latin American derivative markets, instruments operate pro-cyclically, they become more expensive, and sometimes inaccessible for the firm in turbulent periods, when they are most required.

### **3.2 Exchange rate policy and currency risk policy**

In theory, a currency-board or a band regime present less risks than a flexible exchange rate policy. But when asked, financial managers answered that currency risk management depends more on the confidence of investors in the policy than on the type of policy itself.

Therefore it is not the type of foreign exchange rate policy, but the inconsistency between that policy and the evolution of macroeconomic fundamentals which matters. A good example again is the Argentinean case. Currency risk is not less because one peso by law is one dollar. The country now has a risk of a very sharp step devaluation, like any country with a very overvalued currency, and multinational companies try to avoid that risk with a very short cash position.

In the case of a band regime, the analysis is similar. If the exchange rate policy is not consistent with macro fundamentals, and the Central Bank begins to make continuous changes to the range or the center of the band – changing the rules of the game – the perception is that there exists a floating rate, and a higher degree of currency volatility. So the currency risk management will be consistent with the perception of instability in the foreign exchange regime. As an example, between the Tequila and the Asian crisis in Chile, multinational companies of the telecommunications and electric sectors, hedged only less than a half of their total debt in foreign currency. This was due to the Central Bank's credible foreign exchange policy and a persistent revaluation trend of the exchange rate (Ffrench-Davis and Larrain 2002). After the Asian crisis and during

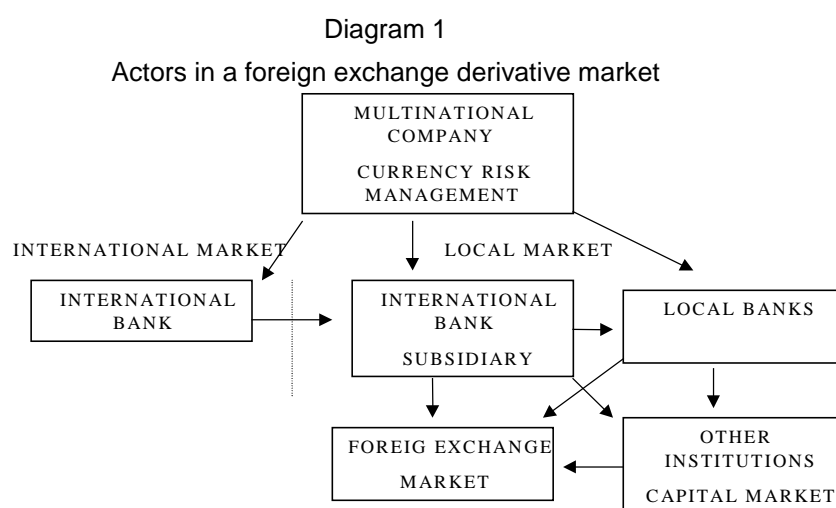
the period of instability in the range of the band, they began to hedge between 70 per cent and 100 per cent of the debt, strategy that has continued now, with the floating exchange rate regime.

As a conclusion, currency risk management by multinational non-financial corporations does not depend solely on exchange rate policy. It is also related to the consistency of that policy and the evolution of the rest of the macroeconomic variables. Without consistency, companies will always have a perception of instability, a change in the rules of the game, spreading a higher degree of uncertainty and therefore the need for a more developed derivative market. At the same time, a more developed derivative market could improve financial conditions for FDI in Latin America.

#### 4 Currency risk management and foreign exchange rate impact

Fender (2000a, b) shows that the use of financial derivatives allowing companies to hedge against interest rate movements has a macroeconomic implication. If the firm can stabilize corporate cash flow with regard to interest rate changes, this will affect the impact of monetary impulses on investment spending as well as on economic activity.<sup>10</sup> As a result, financial accelerator effects of monetary policy are likely to be reduced and monetary authorities will lose some of their power. But what does happen with the foreign exchange transmission mechanism?

Negative external shocks, such as those, which occurred during the Tequila, Asian or Russian crises, bring foreign exchange and financial market distrust. The impact of distrust is transmitted to the cash flow of the firm by the international interest rate, the domestic interest rate (if the firm also has loans in the domestic financial sector) and the foreign exchange rate. The expectations of a step devaluation obliged financial managers to react by a hedging strategy, addressing to the international or domestic derivative markets. (Diagram 1)



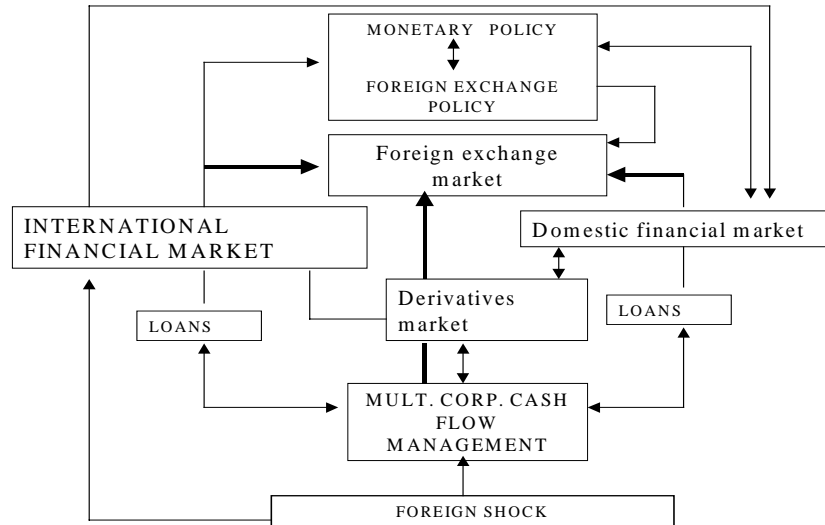
Source: The author

<sup>10</sup> See also Getler and Gilchrist (1994), Bernanke et al. (1996), Oliner and Rudebusch (1996), Carpenter et al. (1998) and Fazzari et al. (2000).



Diagram 2

Multinational company currency risk management and foreign exchange market



Source: The author

Latin American subsidiaries of international banks need to cover their currency exposure, and they do this by selling the local currency to local banks. If the situation is of economic stability, local banks can stay with some degree of exposure, but when there is a crisis they have to cover themselves by buying significant amounts of dollars on the spot foreign exchange market affecting the foreign exchange rate. The final loser will depend on the macroeconomic context before the crisis and on monetary and foreign exchange policy. In the case of Chile, after the Asian crisis, the Central Bank was the most affected, losing four billion dollars of reserves between 1998 and 1999.

As in Latin American countries foreign exchange derivative markets tend to dry up in the middle of a turbulent period – short term capital flows are rapidly remitted to the countries of origin and local financial market lose foreign currency liquidity – instead of contributing to smooth foreign exchange rate movement, they induce more volatility. This volatility is transmitted again to cash flow movements.

The magnitude of the effect on the company will depend not only on factors outside the firm, such as the foreign exchange and monetary policy (Diagram 2), which determines the final scale of the external shock. They will depend also on domestic factors, such as the type of activity of the firm (orientation to the local or the foreign market) and the diversity of their business (concentrated in only one region or distributed all around the world). It depends also on the investment and financing policies and the hedging strategy.

Assuming that multinational companies in Latin America hedge mainly with short-term instruments, a crisis will induce the firm to make a roll over or increase the hedged amount. As we see in Diagram 2, in this case the transmission mechanism between the financial management of the firm and the exchange rate market is through the financial system.

The transmission mechanism goes directly from the firm to the exchange rate market (bold arrow in Diagram 2) if the financial strategy determines the reduction of the exposure, changing foreign exchange debt into local debt or accelerating the remittances of earnings, expected dividends and reserves. In this case the firm will pressure the foreign exchange market by buying dollars and reducing the degree of exposure.

While the reaction of only one firm would not have macroeconomic consequences, all the firms moving in the same direction in a short period, could collectively put a serious pressure on the foreign exchange rate and on the local financial market. If they are in line, the whole lot will come down.<sup>11</sup> During the last few months we have seen this last kind of situation in the Chilean foreign exchange market. The interesting thing was that it was not caused by an expected financial or currency crisis in this country but by the crisis in Argentina.

Because of the low cost of the instruments associated to the interest rate – 4 per cent in the Chilean market instead of 18 per cent in Brazil – national and multinational corporations went to the Chilean financial and derivative markets to hedge their currency exposure while waiting for the Argentinean economy to stabilize. These movements not only affect the foreign exchange market, but they also put pressure on the financial system. If banks are without liquidity – as is often the case when a regional financial or currency crisis is expected – or rise the uncertainty of banking managers, loans are concentrated in large firms while there will be credit restriction to other sectors (mainly small and medium size enterprises). In general, credit also tends to concentrate in the export sector, which is less vulnerable in these circumstances.

## 5 Conclusions

In macroeconomic literature we find comparisons of the volatility of FDI with short term capital flows, concluding that the first is less volatile. On the other hand, business and microeconomic literature, deals with the financial management of corporations, the instruments and models used for optimization. What we do not find are studies of the interaction between microeconomic currency risk management by corporations involved in FDI, and its macroeconomic effects on the volatility of the foreign exchange rate.

Trying to explore this interaction, the article answer three questions:

- i) Is currency risk management of non-financial corporations affected by foreign exchange volatility and financial contagion?
- ii) Have the diverse exchange rate policies different effects over the cash flow management of multinational companies?
- iii) Can we identify a variety of micro-macro transmission mechanisms between currency risk management and the foreign exchange market?

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<sup>11</sup> This example was signaled in the article ‘Patterns in financial markets: predicting the unpredictable’, *The Economist*, 2 June 2001.

In order to approach to the linkages between currency risk management and its impact on the foreign exchange market, we built a typology of financial strategies classifying firms by degree of risk exposure, according to market orientation and the degree of geographical diversification.

Multinational companies in the export sector have the lowest degree of exposure since their incomes, loans and earnings are denominated in the foreign currency and therefore they do not need to hedge transaction or translation risk. In fact they are the most important providers of the foreign currency, contributing to the liquidity of the foreign exchange market. These firms did not stop investing and paying salaries and local inputs during the turbulent nineties. Their stable cash flow management could be observed in subsidiary balance sheets.

Multinational companies that are regionally and geographically diversified always hedge against transaction or cash flow exposure, but they very seldom hedge against translation (accounting or balance sheet) exposure. This is because devaluation in one country could be compensated with revaluation in another.

The companies that face the largest problems with currency risk exposure are multinational companies oriented to the local market and with investments concentrated in one region or in the public service sector, whose earnings are in the local currency. In theory they are supposed to hedge the whole of their transaction and translation exposure. Nevertheless, it is very costly to hedge a significant percentage of the risk involved because of the weakness of the institutional framework, the liquidity in periods of turbulence and the lack of development of instruments in the derivative market for Latin American currencies. In fact, the difficulties of hedging have led to important losses in accounting exposure, that is in the value of assets and liabilities.

In addition to the above, there is the asymmetry of information between the financing sector and the non-financing corporations, making it difficult for the latter to negotiate the value of the needed instruments, increasing the cost of derivative instruments for long term hedging. While the financial managers of subsidiaries justify their behaviour in those terms, the bankers indicated that this is, in fact, a speculative behaviour since the financial managers of non-financial corporations prefer to have some risk exposure than to pay a higher cost for the derivative instrument. But the excessive cost of derivative instruments in turbulent periods support the arguments of the former.

In relation to the second question, in countries with a currency board or a band regime, managers would not need to hedge currency risk, since in theory there exists a foreign exchange security granted by the Central Bank. But financial managers stated that without consistency between the foreign exchange regime and the monetary and fiscal policy – that is with macroeconomic fundamentals – companies will always have a perception of a change in the rules of the game and they will increase the need for hedging, as the recent Argentinean crisis dramatically illustrated.

The answer to the third question depends on the orientation and the degree of geographic diversification of the market. The largest impact is that generated by those multinational companies that are in the public service sectors or whose production is concentrated on the local market and in a region. Unfortunately, the lack of statistical information is an obstacle to measuring the magnitude of the impact, and for that reason in this paper we only gave some idea, on the transmission mechanisms between currency risk management and the foreign exchange market.

We can identify two transmission mechanisms, both beginning with the financial management of multinational non-financial corporations. One goes directly from the cash flow management of the firm to the foreign exchange market. This occurs when the multinational company decides to change liabilities from foreign to local currency, or increase remitted dividends. In both cases managers go to the foreign exchange market to buy dollars at the spot price. When this happens in the middle of a crisis and is a generalized behaviour, it puts a pressure towards the devaluation of the local currency.

The second is an indirect mechanism of transmission that goes from the financial management of the firm through the financial system. In this case the banks themselves will have to hedge their currency risk exposure, particularly if they are facing or expecting an international or regional financial crisis. They will pressure the local currency and the impact will depend on the capacity of the Central Bank to respond to the shock.

This mechanism of transmission might not only affect the country facing a currency crises, but also neighbouring countries as exemplified by the impact of the recent Argentinean crisis on the Chilean exchange rate. In this case, the combination of a flexible rate with a monetary policy oriented to reactivate the economy in Chile induced Argentinean multinational firms to turn towards the Chilean derivative market.

Notwithstanding the need to improve the regulation of derivative markets to enhance counter cyclical behaviour, the development of a market for derivatives could permit longer terms and a variety of instruments. These in turn could allow the stabilization of cash flow management, the reduction of translation risk and the avoidance of pressures by non financial multinational companies over the foreign exchange market in turbulent periods. But while this could be a good solution for short-term microeconomic behaviour, it will not resolve the macroeconomic problem of countries facing foreign shocks in a context of inconsistency between foreign exchange policy and macroeconomic imbalances.

A further study of the macroeconomic impact of currency risk management by multinational corporations would require detailed national case studies for which this paper provides a general framework and some guidelines on the aspects to be examined. First, it would be necessary to make a detailed study of the functioning of the derivative markets and the institutional framework that governs its operations, including the volume and terms of the transactions. Second, the foreign exchange and monetary policies of each country will have to be considered because of their impact on the financial and derivative markets. And third, the impact over the foreign exchange rate of the strategies with which the different types of multinational and national corporations face those markets.

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