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THE DEVELOPMENT ROLE OF COMMODITY EXCHANGES

Note by the UNCTAD secretariat

Executive summary

This paper sets out the role of commodity exchanges as trade-facilitating institutions that can catalyse growth in developing-country commodity sectors by significantly reducing the transaction costs along the commodity supply chain.

Structural changes in underlying commodity markets – in particular, liberalization and the substantial withdrawal of government support for the sector – initially drove the promotion by emerging-market Governments of exchanges as an instrument for commodity sector development. In recent years, largely as a result of advances in information and communications technology, the realistic level of ambition has expanded further. Commodity exchanges are going beyond earlier constraints to trade faster at lower cost, in a greater number of contracts and instruments, with enhanced trading and clearing functionality, with more robust regulatory and self-regulatory architectures, targeting customer or product niches that were previously considered unreachable or unprofitable. The breadth and depth of development impacts have expanded accordingly.

This paper examines the utility of a commodity exchange for boosting the capacity of producers and processors to participate advantageously in commodity supply chains through a range of multifaceted, positive impacts that can transform practices and attitudes for the better. Recognizing that such benefits do not automatically follow from the establishment of a commodity exchange, the paper also addresses key challenges for promoting a robust but facilitative regulatory environment. Finally, with South–South commodity trade and regional integration emerging as key drivers of the global commodity economy, the role of commodity exchanges in supporting these phenomena is examined.

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I. COMMODITY EXCHANGES, THEIR ROLE AND WHY THEY ARE IMPORTANT

1. Commodity exchanges are defined in this paper as a market in which multiple buyers and sellers trade commodity-linked contracts on the basis of rules and procedures laid down by the exchange. Within this definition, it is recognized that the nature of the instruments and contracts traded (see box 1),¹ and indeed the central purpose of the institution, can vary considerably by region and sector. Thus, the definition of commodity exchanges can include exchanges offering spot trade for immediate delivery of the commodity or forward contracts which result in future delivery. It can also include exchanges offering trade in commodity-based futures and options contracts – financial instruments most commonly used by commodity sector participants to manage their price risk and which only rarely result in the delivery of the physical good. Finally, it may include exchanges which focus on the facilitation of trade, rather than the trade itself – for example, some Turkish exchanges have served as a centre for registering transactions for tax purposes.

2. This introductory section provides a brief overview of why commodity exchanges are an increasingly central feature of the policy debate about the commodity economy, looking at both the conceptual and practical dimensions. On a conceptual level, a transaction cost analysis helps build an understanding of the facilitative role played by an exchange. The “transaction cost” school of economics criticizes neoclassical economics for assuming a world of costless transactions. In the words of Coase:

“[The assumption that there are no costs involved in carrying out market transactions] is of course very unrealistic. In order to carry out a market transaction it is necessary to discover who it is that one wishes to deal with, to inform people that one wishes to deal and on what terms, to conduct negotiations leading up to a bargain, to draw up the contract, to undertake the inspection needed to make sure that the terms of the contract are being observed, and so on. These operations are often extremely costly, sufficiently costly at any rate to prevent many transactions that would be carried out in a world in which the pricing system worked without cost.”²

Box 1. Commodity-linked contracts

Spot (or cash): Contracts for the purchase or sale of a commodity with immediate delivery (i.e. within a few days).

Forward: Contracts for the purchase or sale of a commodity with deferred, i.e. future, delivery.

Futures: Standardized forward contract which represents an obligation to make or take delivery of a fixed quantity and quality of a commodity at a specific location. Contrary to forwards, futures contracts do not often result in physical delivery as they can be offset by an equal and opposite contract before the delivery date.

Option: A contract giving the right, but not the obligation, to buy or sell a futures contract at a specified price at or before some later date. To obtain such a contract, the buyer needs to pay a premium: the maximum loss is limited to this premium. The seller of an option receives the premium, but the potential loss is theoretically unlimited.

Swap: An exchange of future payment streams between two counterparties.

¹ For a further description of these instruments, see “A survey of commodity risk management instruments” (UNCTAD/COM/15/ Rev.2, 1998).

² Coase RH (1960). The problem of social cost. *Journal of Law and Economics*, 3: 1–44.

3. In the context of trade, mediating institutions are often essential to provide the framework of rules and procedures by which individuals or organizations can engage in mutually beneficial transactions. Institutions can reduce uncertainties and therefore the cost of trade. This logic is outlined by North: "Institutions are formed to reduce uncertainty in human exchange. Together with the technology employed they determine the costs of transacting... When it is costly to transact, institutions matter. And it is costly to transact."³

4. How does this relate to the commodity economy in developing countries? In a situation bereft of trade-facilitating institutions, a significant number of incremental, non-production costs would be incurred by the parties to a commodity-linked transaction (see box 2). Taken together, these costs would arguably account for considerable expense, consuming substantial funds, time and goodwill. Moreover, transaction costs tend to be significantly higher in developing economies than in developed ones, as a consequence of imperfect market formation and weak or missing infrastructure and sectoral support institutions.⁴ Even within the same economy, transaction costs tend to be significantly higher in transactions involving the poor than in those involving wealthier sections of the population, burdening the most vulnerable with higher prices they can ill afford.⁵

Box 2. Transaction costs in the commodity economy

Measurement/information costs prior to the transaction:

- Finding a buyer or seller with whom to transact
- Appraising the reliability of the counterparty
- Determining and locking in an acceptable price
- Ascertaining product quality
- Securing finance to fund the transaction
- Defining delivery and payment modalities, and other contractual terms and conditions

Enforcement/compliance costs after the transaction:

- Managing credit and cash flows
- Overseeing delivery
- Grading of product quality
- Arbitrating disputes
- Insuring against, or compensating for, default
- Sanctioning and excluding defaulters

5. The utility of a commodity exchange therefore lies in its institutional capacity to remove or reduce the high transaction costs faced by entities along commodity supply chains in developing countries – producers, processors, traders, manufacturers, wholesalers, retailers and end-users. They reduce transaction costs by offering services at lower cost than would otherwise be incurred by commodity-sector participants acting outside an institutional framework. By reducing costs for the parties to a potential transaction, a commodity exchange

³ North DC (1994). The new institutional economics and development. *Economics Research Forum*, 1 (2).

⁴ See James J (2002). Information technology, transaction costs and patterns of globalisation in developing countries. *Review of Social Economy*, 60 (4): 507–519.

⁵ A study of India shows that the poor tend to pay prices that are between 20 per cent and 5,300 per cent higher than those paid by more affluent consumers, depending on the product in question, in part as a result of higher transaction costs, particularly in distribution (Prahalad CK and Hammond A (2002). Serving the world's poor profitably. In: The poor and high cost economics ecosystems, *Harvard Business Review*, September 2002).

can stimulate trade, thereby contributing welfare gains to commodity-sector participants proportionate to the level of cost reduction delivered.

6. The reduction of transaction costs is the overarching explanation for the purpose of a trade-facilitating institution such as a commodity exchange. It is also the unifying theme that links the three subjects that will be discussed further in this paper: development impacts; regulation; and regional integration and South–South trade. Before addressing these subjects, however, we will look at two further factors pertaining to the wider environment that reveal the growing importance of commodity exchanges in the contemporary commodity economy.

7. Firstly, many commodity sectors in developing and transitional economies have undergone severe structural reform in recent decades. Extensive liberalization has seen a substantial withdrawal of government support for the sector. As a result, the supply chains to which commodity-sector participants were accustomed have in many cases ceased to operate. Access to markets has become less predictable, as has access to the ancillary services that, for example, parastatal marketing boards used to facilitate in the past – services that include market information, storage and logistics, finance, extension services and input supply. Without the stabilizing institutions and the established set of practices that previously enabled engagement in commodity supply chains, transaction costs have risen steeply for many commodity-sector participants. The impact has been most severe for small producers that are geographically remote or in other ways marginalized from trading centres. Thus, the commodity exchange, which can provide many of the same services as parastatal marketing boards on a financially sustainable basis, may represent one of the best means to fill the void arising from government withdrawal from the sector.

8. Secondly, there have been significant advances in information and communications technology (ICT) in recent years. In essence, advances in ICT can be understood as a means to “significantly reduce the high transaction costs that face poor, rural populations, which can have a long-lasting positive impact on economic development” (Singh 2004).⁶

9. This is a valid appraisal of the relationship between commodity exchanges, ICT and rural development. A new generation of ICT-enabled commodity exchanges in the developing world are now, more than ever, trading at lower cost, in a greater number of contracts and instruments, at faster speeds, with enhanced trading and clearing functionality and with more robust regulatory and self-regulatory architectures, targeting customer or product niches that were previously considered unreachable or unprofitable. In India, for example, three new national multi-commodity exchanges have systematically identified weaknesses and inefficiencies in commodity supply chains and sectoral institutions to develop a series of solutions that effectively leverage technology while broadening participation in the markets, including to small producers (see box 3).

Box 3. Information and communications technology and Indian national commodity exchanges

- Online, electronic nationwide trading to integrate fragmented markets and improve price formation
- Electronic price dissemination networks to reduce information asymmetries and empower farmers

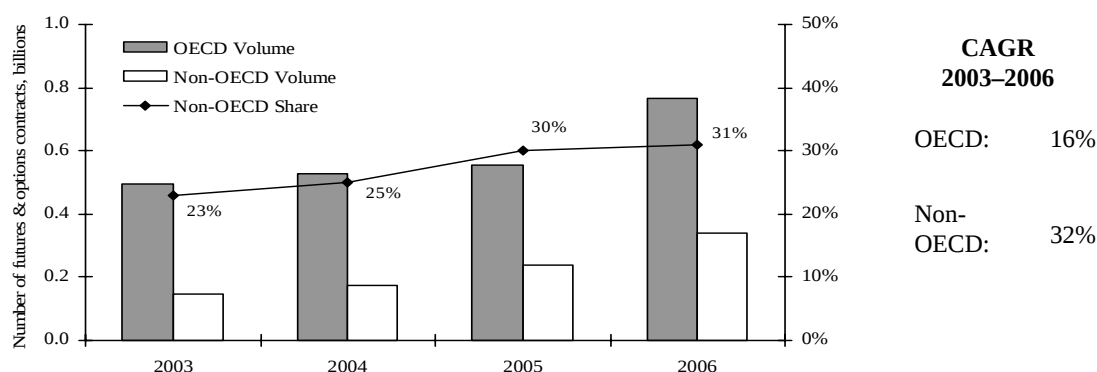
⁶ Singh N (2004). Transaction costs, information technology and development. Santa Cruz Center for International Economics, Paper 04-22.

- Satellite-enabled exchange connectivity to overcome infrastructure deficiencies
- Technology-enabled distribution partnerships to deliver exchange services to hard-to-reach commodity producers
- Integrated collateral management – including electronic warehouse receipt systems – to improve logistics efficiency and reduce handling costs
- Real-time reporting of market participants' positions and credit balances, enabling more effective regulatory oversight
- Interactive remote-learning programmes for capacity-building and human resources development

10. The emerging commodity exchange can thus be said to pursue a triple mission in which the standard organizational mission of an exchange to build liquid and efficient markets may be supplemented in developing country contexts with two further missions: a wider development mission rooted in the need to catalyse entire sectors whose participants tend to include some of the world's most impoverished people; and a related participatory mission to make market instruments relevant for, and usable by, the ordinary citizen.

11. The data reflect these developments. Since 2003, commodity exchanges in developing countries have experienced a rate of volume growth double that of their more established counterparts situated in countries of the Organization for Economic Cooperation and Development (OECD) (see fig. 1). In terms of the number of contracts traded, if not their value, developing countries now account for 30 per cent of volume.

Figure 1. Exchange-traded commodity derivatives volumes, 2003–2006



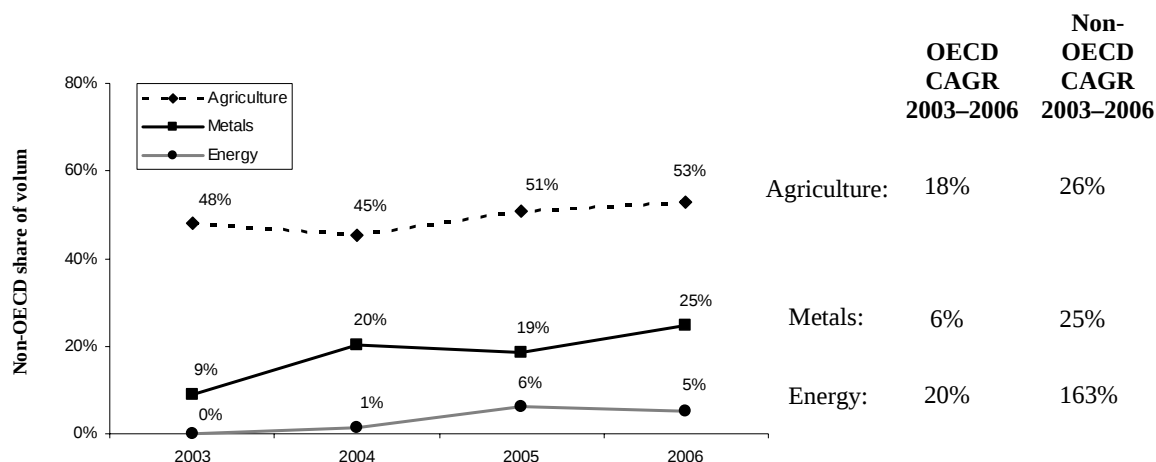
Source: UNCTAD.

Note: The dataset comprises the world's leading commodity exchanges, defined as those trading over 1 million futures and options contracts per annum.

CAGR = compound annual growth rate.

12. This rapid growth has resulted in an increasing share for developing countries of overall commodity futures and options trading; that share is currently approaching one third and is rising fast. Moreover, when the data are disaggregated on a sector-by-sector basis (see fig. 2), it can be seen that developing countries have now overtaken their OECD counterparts in a sector as critical to their development as agriculture. Rapid volume growth has also been experienced in developing-country metals and energy sectors, albeit with developing countries' share in energy remaining low as high and volatile international oil prices have stimulated energy-trading in OECD markets.

Figure 2. Sectoral growth of exchange-traded commodity derivatives volumes, 2003–2006



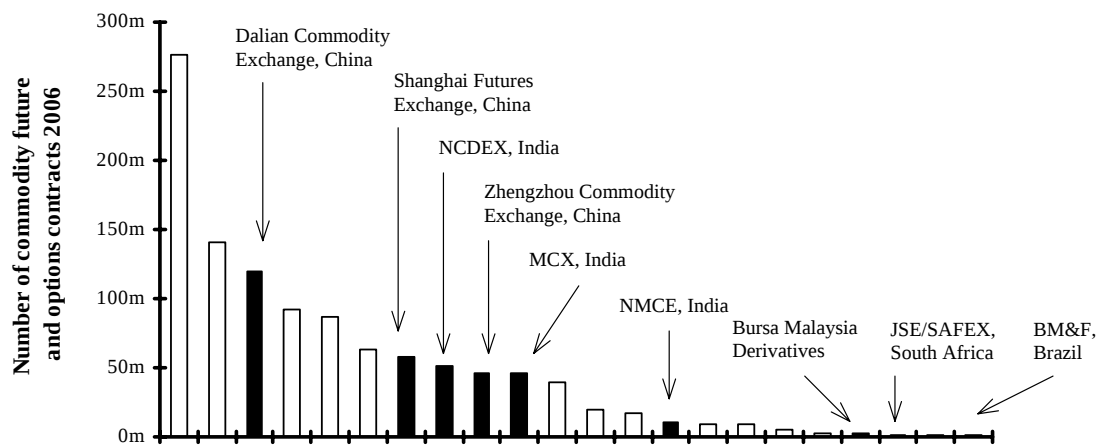
Source: UNCTAD.

Note: The dataset comprises the world's leading commodity exchanges, defined as those trading over 1 million futures and options contracts per annum.

13. It should also be emphasized that, measured in volume of contracts traded, a significant number of the world's leading commodity exchanges (9 out of 22) are now located in the developing world, as shown in figure 3.

14. Thus, commodity exchanges situated in developing countries are becoming not only an increasingly important instrument for development within the national context but also, given their increasing global prominence, a key driver for the development of international trade linkages, including regional integration and South–South trade.

Figure 3. The world's leading commodity exchanges, 2006



Source: UNCTAD.

Note: The dataset comprises the world's leading commodity exchanges, defined as those trading over 1 million futures and options contracts per annum.

Box 4. The contribution of UNCTAD to the field of commodity exchanges

UNCTAD has supported the establishment and development of commodity exchanges and associated institutions in developing and transitional economies over the last 15 years. UNCTAD's support consists mainly of:

- Direct technical assistance for exchanges or exchange initiatives: UNCTAD has worked in countries such as the Dominican Republic, Ghana, Kazakhstan, India, Indonesia, Malaysia, Nigeria, the Russian Federation, Sri Lanka, Turkey and Ukraine, and has provided assistance for the planned regional exchange for Africa
- Research, policy advice and awareness-raising through publications, presentations and the organization of conferences, including the Emerging Markets Forum since 1999 at the Swiss Futures and Options Association's annual Bürgenstock International Derivatives Conference

As an international organization with considerable accumulated knowledge of commodity sector development, UNCTAD acts as an impartial "honest broker" as regards the role of commodity exchanges and the solutions they offer, helping to facilitate partnerships between public, private and non-profit sectors in the developing world.

II. DEVELOPMENT IMPACT OF COMMODITY EXCHANGES

15. In recent years, the realistic level of ambition for commodity exchanges in developing countries has expanded. Largely driven by advances in information and communications technology, commodity exchanges are moving beyond earlier constraints to become institutional catalysts for upgrading the performance of the commodity sector and integrating supply chains.

16. Where high transaction costs impede the realization of mutually beneficial trade within and across developing-country commodity sectors, the presence of a commodity exchange can trigger a reduction of these costs in many significant dimensions. While a commodity exchange should not be considered a panacea for the myriad challenges that face developing-country commodity sectors, it can yield a series of multifaceted positive impacts that can improve practices and attitudes among participants throughout commodity supply chains (see box 5).

Box 5. Summary of potential enhancements arising from commodity exchanges

- Market creation
- Stimulation of regional integration and South-South trade
- Price risk management
- Price discovery
- Price transparency
- Reduction of counterparty risk
- Accepted dispute-resolution procedures
- Innovative applications for exchange mechanisms
- Contract standardization
- Improved quality
- Market access
- Infrastructure enhancement
- Facilitated provision of commodity finance

17. Most directly, the core function of a commodity exchange – to create markets by providing a forum in which multiple buyers and sellers can trade commodity-linked contracts – reduces the costs associated with finding a buyer or seller with whom to transact. This was the rationale behind the creation of the Chicago Board of Trade in 1848 by a group of merchants keen to establish a central marketplace for trade. Before that time, farmers all too often found no buyers for the grain they had transported to Chicago and the high cost of return transport meant that many had little choice but to dump their unsold produce in the lake. As globalization has intensified the potential for international trade linkages, the same rationale now operates at the international level. Thus, as a central focus for trade in a given geographical area or jurisdiction, a commodity exchange can cement links with regional or international buyers and sellers. In this way, it can stimulate regional integration and South–South trade.⁷

18. In addition to spot trade for immediate delivery, a commodity exchange may provide price risk management solutions by offering trade in commodity forwards, futures and options contracts. This addresses the fact that as Governments have withdrawn from the sector,⁸ commodity-sector participants have become increasingly exposed to the notorious price volatility that has long afflicted global commodity markets. Price volatility breeds risk, and vulnerability to risk is recognized as one of four dimensions that constitute poverty.⁹ When farmers receive prices that are unstable and uncertain, they run price risks from the moment they decide to plant a crop, and every time that they buy and apply inputs such as fertilizers or pesticides, or use paid labour. Uncertainty about the price level that will be ultimately received deters investment and dampens growth. By confining producers to cycles of low investment and low return, price volatility creates and sustains rural poverty.

19. The cost of using exchange-traded price risk management solutions can vary by instrument type, level of price risk exposure for the specific commodity, and the commissions charged by the exchange, a broker or some other kind of intermediary. In many situations, however, exchange-traded instruments offer a price risk management solution at relatively low cost.¹⁰ These “hedging” instruments can bring greater certainty over the planting cycle, allowing those active in the commodity sector to commit to investments that yield longer-term gains as well as increasing the viability of planting higher-risk but higher-revenue crops. Even in the face of a long-term decline in the prices of their commodity, the ability to hedge

⁷ See chapter IV of this paper.

⁸ In the 1980s and 1990s, often under the auspices of World Bank-driven structural adjustment programmes, a significant number of developing-economy Governments stopped performing a wide array of production support and marketing functions in the agricultural economy, signalling a move towards a market-based system of sectoral governance.

⁹ World Bank, *World Development Report 2000/2001*; the four dimensions are income poverty, deprivations in health and education, vulnerability to risk, and voicelessness/powerlessness.

¹⁰ However, in some circumstances, the exchange-traded solution can be more costly for managing a given level of risk than a customized off-exchange – or “over-the-counter” – risk management solution provided by a commercial partner or a financial institution. It might also be more costly than other risk mitigation steps, such as insurance, crop diversification or various forms of price risk management embedded in physical trading contracts with suppliers, purchasers or other service providers (although the latter solution would result in transferring the price risk to the counterparty, which most likely would still require exchange instruments to hedge their exposure). For more about price risk management embedded in physical trading contracts, see “Farmers and farmers’ associations in developing countries and their use of modern financial instruments” (UNCTAD/ITCD/COM/35).

against shorter-term price movements provides farmers with a window in which to adjust cropping patterns and diversify their risk profile.

20. Whether through trade in spot or futures contracts, commodity exchanges can provide a price discovery mechanism through which prices come to reflect known information about the market. They thereby create price levels that are an accurate reflection of the actual supply/demand situation. It is also noted that the veracity of prices discovered on an exchange is enhanced to the extent that there is in place a robust regulatory framework to deter, identify and take steps against manipulative practices that can distort price formation.

21. When price information is published and disseminated by an exchange,¹¹ the resulting price transparency provides a readily available price reference to sector participants. This reduces costs that would otherwise have been incurred to discover and negotiate an acceptable price of exchange between parties to a transaction. In particular, readily available price references can benefit farmers who are otherwise disconnected from the market and vulnerable to receiving suboptimal prices and conditions from better-informed intermediaries. Information disseminated by the exchange can therefore reduce information asymmetries that privilege intermediaries, empowering commodity-sector participants to take better decisions in light of a more accurate understanding of market conditions. In India, for example, recent research has shown that approximately 90 per cent of mentha oil farmers say that the availability of pricing information through the Multi Commodity Exchange of India (MCX) has helped them to realize better returns over time.¹²

22. Where futures prices are discovered on an exchange, producers can use these prices as a guide in their decision on whether to sell now or to wait for better prices. Futures prices also enable farmers to base cropping decisions on the anticipated market price at the time of the next harvest rather than on the current spot price. This reduces the so-called “cobweb effect” of inter-seasonal price fluctuations.¹³ Futures prices also act as important signals in the calculations and decisions used by commodity importers and exporters. In South Africa, for example, the transparency of grain futures prices, together with the acceptance of foreign grains for delivery through the JSE/SAFEX exchange, acts to ease supply shortages, which can significantly increase the prices of staple food crops.

23. Four further reductions in transaction costs often arise as a result of channelling trade through a commodity exchange. Firstly, where exchanges establish procedures to effectively vet market participants and then guarantee the trade that takes place through the exchange, there may be a substantial reduction in counterparty risk faced by the parties to a transaction, in some cases almost to zero. This reduces the costs that would otherwise have been incurred in assuring the reliability of trading partners and taking out insurance policies to cover default. Furthermore, where contractual breaches occur, exchange procedures often offer binding dispute resolution mechanisms, including arbitration and sanctioning of parties that renege or

¹¹ An exchange is often also in a position to disseminate other important forms of market information. These may include: volume of open positions; depth or liquidity in the market; stocks and flows at warehouses; and acceptable quality standards, including premiums/discounts for superior/inferior quality.

¹² UNCTAD-MCX research data, 2007.

¹³ A simplified example of the cobweb effect: based on high spot prices for crop *x* in season 1, farmers will increase their production of crop *x* for season 2. When harvest occurs in season 2, there is a glut of crop *x*, leading to low prices. Farmers will then reduce production of crop *x* for season 3, leading to high prices again, and so on.

default upon their obligations. This can act as both a deterrent against default and a mechanism for maintaining the integrity of the market.

24. Secondly, an exchange clearing house, by managing the clearing and settlement of agreed contracts, can reduce transaction costs associated with the flows of cash and credit between parties to a transaction. Thirdly, the mechanisms established for commodity-linked trade can often be used in innovative ways to provide solutions for commodity-sector participants facing barriers arising from various kinds of imperfect market formation (see box 6). Finally, where an exchange standardizes elements of the contracts in which it trades – including quantity and quality specifications for the traded product, the delivery and payment modalities, other contractual terms and conditions – it can reduce the costs that would otherwise have been incurred in drafting a sufficiently robust contractual agreement with satisfactory terms for all parties to a transaction.

Box 6. Latin American commodity exchanges: an innovative use of exchange mechanisms

A comprehensive analysis of the benefits arising from a commodity exchange should not overlook their capacity to evolve innovative applications for exchange mechanisms. Latin American commodity exchanges have been particularly prolific in this respect. The innovative use of exchange mechanisms in Latin America is reflected in three broad categories:

- **Financing mechanisms:** Commodity exchanges in Colombia and the Bolivarian Republic of Venezuela have created mechanisms that allow the commodity sector to bypass banks and tap directly into local capital markets through the trade on exchanges of farmer repurchase agreements, or “repos”. These instruments are particularly appealing where banks may not be interested in exposing their own capital to agricultural credit risks.
- **Allocative mechanisms:** Commodity exchanges in Panama and Honduras have adapted exchange mechanisms to allocate tariff and import quotas among competing interests. The use of the exchange as an intermediary that brings together interested transactional counterparties within a rule-based framework can promote broader participation and increased transparency.
- **Upgrade of physical markets:** Brazil’s BM&F Exchange has acted to upgrade trade in underlying commodities where previously markets have been fragmented and inefficient. In 2002, it founded the Brazilian Commodity Exchange (BBM) as a dedicated agribusiness exchange to link agriculture, commerce, industry, finance and government. Integrating six previously distinct regional markets, its objectives have been to upgrade and commercialize the agricultural sector, and to provide a reliable and transparent mechanism for the exercise of government agricultural policy.

25. In particular, when an exchange standardizes the quality specification for commodities eligible for delivery at its facilities in line with industry needs, it can drive an upgrade in the quality of the traded commodity while reducing one of the most well-documented transaction costs that can impede trade in commodities – the requirement for would-be purchasers to receive assurance about the quality of the commodity they would receive.¹⁴ A transparent set of quality standards provides a strong incentive for farmers to upgrade production to better meet the requirements of purchasers while stimulating moves towards greater product

¹⁴ See, in particular, Akerlof GA. The market for “lemons”: Quality uncertainty and the market mechanism. *The Quarterly Journal of Economics*, 84 (3): 488–500.

standardization. With appropriate efforts to disseminate this information to farmers and enhance their capacity to supply to specification, the farmer has a greater opportunity to participate in emerging supply chains – national, regional and global – in which quality standards are playing an increasingly important role.

26. Moreover, it is not only individuals or organizations in major trading centres that can benefit from these services. An exchange which proactively extends its services to remote or otherwise marginalized commodity sector participants can expand market access. For some small producers, the transaction costs to trade would otherwise be simply too high: such producers could be excluded from markets altogether and confined to a subsistence livelihood. For others, high transaction costs can create monopolistic or oligopolistic local market conditions in which transactions are possible only with a few select local traders but at terms highly disadvantageous to the small producer. Access to an exchange's markets can enable producers to supply a larger pool of demand while empowering them through a system of impersonal transactions at prices determined on the open market. In India, for example, the three national multi-commodity exchanges have placed price screens and trading terminals in the country's 7,500 "mandi" wholesale markets, as well as in many small towns and villages, thus expanding access to the commodity futures market across a vast geographical area.

27. Aside from its direct trading functionality, an exchange can also stimulate enhancements in the wider environment of developing and transitional country commodity sectors. When an exchange drives the creation of a warehouse network to improve the efficiency of its delivery and collateral management processes, it can substantially enhance the storage and logistics infrastructure for the traded commodities. It is well documented that developing countries face high costs of storage and transportation, which the presence of an exchange can reduce.¹⁵ The exchange can catalyse the expansion of capacity while warehouses accredited by an exchange have strong incentives to introduce a more rigorous process for overseeing delivery and grading the delivered commodity to ensure it meets contractual specifications. This can reduce costs that arise from lengthy or mishandled delivery procedures and wastage arising from receipt of goods that fall below standard.

28. In addition, a reliable system of collateral management, in particular warehouse receipts, can make the provision of commodity finance to the sector a more viable proposition for prospective financiers. Enhanced management of physical collateral enables greater security and lower risk for banks to lend to commodity producers. It can therefore substantially reduce the cost of finance to commodity producers and processors when compared with unsecured bank lending and especially when compared with informal lending channels. With greater access to financing, the commodity-sector participant is better placed to make sustainable medium- or long-term investments in upgrading their activities.

29. Taken together, storage, logistics and finance help farmers to avoid distress sales – goods can be transported to and stored in a secure facility, and finance can be accessed to cover ongoing expenses and investments for next season's crop. In this way, farmers do not have to make a sale immediately after harvest when prices tend to be at their lowest. Instead, the farmer can use the exchange's pricing information to wait for better market conditions,

¹⁵ For example, in the United Republic of Tanzania, transport costs are estimated to account for 60 per cent of the total marketing cost for maize, and losses due to inadequate storage facilities are estimated to be about 30–40 per cent of production. See UNCTAD (2001), "Potential and constraints of the agricultural commodities in the United Republic of Tanzania", UNCTAD/Common Fund for Commodities Workshop, Geneva, 22–23 March.

and thereby increase his income. Moreover, intra-seasonal price volatility in agricultural markets can be reduced as the supply of crops to market is staggered more evenly across the season.

30. There are two further points relevant to an appraisal of commodity exchanges as an effective policy instrument. On the basis of the above analysis, it can be argued that participants in developing-country commodity sectors do not need to actively trade on an exchange to reap the benefits of its existence. The availability of published market information, improved storage and logistics infrastructure, transparent quality standards and cheaper and more accessible sources of finance are positive externalities from exchange operations that can make a significant improvement to farmers' livelihoods, even if farmers remain largely oblivious to the exchange's trading functions.

31. On the other hand, it is emphasized that none of the beneficial impacts outlined above automatically follow from the establishment of a commodity exchange. Firstly, a domestic commodity exchange is not necessarily an appropriate policy instrument for all markets and all commodities. Secondly, an exchange which is badly structured or poorly managed is unlikely to deliver such enhancements to underlying commodity sectors. Thirdly, exchanges in various parts of the world take different forms, not all of which offer the same range of services or have the same strategic priorities: the extent to which prospective enhancements are delivered depends largely on the choice of services offered and the strategic priorities pursued by the exchange. Finally, a well-functioning commodity exchange is predicated upon a robust legal/regulatory framework, as will be discussed in the next section. For all these reasons, the successes of commodity exchanges in one part of the developing world may not be easily replicated elsewhere. Instead, each situation should be addressed on its own merits, with the exchange – if it is an appropriate policy instrument – structured to fit specific market requirements.

III. REGULATION AND COMMODITY EXCHANGES

32. Regulation can be a complex activity and the regulatory framework for a commodity exchange will depend to varying extents on the nature of the instruments and contracts traded, the specifics of the underlying commodity sectors and the wider legal, political and economic context of the jurisdiction under which the exchange falls. Consequently, there is not the space here to adequately address all the dimensions and issues that can arise.¹⁶ This section will therefore set out the basic principles and forms of regulation while taking a brief look at some of the major issues for the Governments of developing countries in considering how best to regulate commodity exchanges.¹⁷

33. Trade-facilitating institutions boost trade by reducing the uncertainty and therefore the cost of trade. This is achieved through a framework of rules and procedures that provide individuals or organizations with the confidence to engage in mutually beneficial transactions. According to the Objectives and Principles of Securities Regulation of the International

¹⁶ Useful references on the subject of regulation include: Corcoran et al. *Designing a derivatives complement to cash markets in developing countries*. In: *Focus on Capital: New Approaches to Developing Latin American Capital Markets* (Inter-American Development Bank, 2002); and documents in the "library" section of the International Organization of Securities Commissions website (www.iosco.org) and the "reports & publications" section of the Commodity Futures Trading Commission website (www.cftc.gov).

¹⁷ This section will address commodity exchange regulation in its most sophisticated form, i.e. as it pertains to commodity futures markets.

Organization of Securities Commissions (IOSCO),¹⁸ the role of regulation is threefold: to ensure that these rules and procedures are enforced in a manner that is fair, efficient and transparent, so as to maintain market integrity; to uphold financial integrity through effective management of systemic risk; and to protect investors from unscrupulous or irresponsible practices by exchanges, counterparties or intermediaries. Regulation typically exists at three levels: at the level of the market as a whole, at the level of the exchange and at the level of the intermediaries between the exchange and the end-user.

34. Standard features of commodity exchange regulatory structures are depicted in table 1,¹⁹ arranged according to both the objective of the regulation and the level at which it is applied. Table 1 demonstrates that the typical commodity futures market is a highly regulated environment with multiple layers of often mutually reinforcing oversight. The role of government within this structure is twofold: it has an oversight role, disciplining those who try to manipulate the markets for their own benefit and ensuring the sanctity of contracts; and it has an enabling role, providing the necessary legal and regulatory framework, and, in certain circumstances, elements of the physical infrastructure without which market actors cannot function properly (e.g. warehousing, transportation, telecommunications and information networks).

Table 1. Standard features of commodity exchange regulatory structures

	Market-level regulation	Exchange-level regulation	Intermediary-level regulation
Market integrity	• Registration and licensing of exchanges, clearing houses and intermediaries • Approval process for new contracts • Surveillance through information collection and analysis to guard against market manipulation, anti-competitive behaviour and other fraudulent activities • Position reporting of large traders across exchanges and markets • Auditing of self-regulatory organizations (i.e. exchanges and industry associations) • Information-sharing with foreign regulators to monitor participants and/or transactions with cross-border dimensions • A framework for intervening and sanctioning market participants or market institutions for	• Time-stamped audit trail of all trading activity • Transparent reporting of transactions, prices and other market information, made available to all market participants • Position limits for speculative market participants to prevent “speculative excess” • Stricter position limits during the delivery month to protect against squeezes and other forms of manipulation • Audio/video surveillance of trading floor activity • Accreditation and monitoring of delivery facilities • Sensitive data treated with highest levels of confidentiality and security by exchange personnel and systems	• Good character (or “fitness”) requirements for market intermediaries • “Know your customer” requirements (including anti-money laundering provisions) • Protections against abuse of customer orders (e.g. to prevent intermediaries from giving precedence to their own interests over those of the client by executing broker orders before potentially market-moving client orders – a practice known as “front running”)

¹⁸ International Organization of Securities Commissions, 2003; available at www.iosco.org.

¹⁹ Although it is noted that every regulatory framework is different, incorporating some or all of the mechanisms set out above, as well as other mechanisms that may not feature here.

	Market-level regulation	Exchange-level regulation	Intermediary-level regulation
	violations of market regulations or statutory law		
Financial integrity	• Clearing-house minimum capitalization requirements • Intermediary financial reporting requirements • Requirements for the use of established accounting standards for positions taken in the markets	• Margin deposits required without exception from clearing members as performance bonds: (i) initial margin when entering positions; (ii) variation margin, calculated daily on a marked-to-market basis; (iii) special margin during delivery period or periods of high volatility • Clearing-member minimum capital requirements and capital-based position limits • Clearing-house guarantee fund to compensate members in case of default, financed with contributions by clearing members and backed by a default insurance policy • Special measures in the case of high volatility – trading halts (“circuit breakers”), cool-off periods and imposition of special margin	• Margin deposits required from clients as performance bonds • Client minimum capital requirements and capital-based position limits
Investor protection	• Legal framework that provides: (i) legal certainty for recognition of contracts and associated obligations of counterparties; (ii) definition of legal relationships between market participants in transaction execution, clearing and settlement, and delivery (clients, brokers, exchanges, clearing houses and settlement banks) • Monitor exchanges to ensure fair and equitable treatment of all participants • Oversight of exchange governance – governing boards to reflect interests of all major stakeholders	• Defined, transparent, binding rules and bylaws governing exchange operations, especially the delivery process • Binding arbitration mechanisms for resolution of member disputes • Binding sanction mechanisms for members in default of obligations	• Qualification standards for, and licensing of, market intermediaries • Governance of intermediary marketing practice (e.g. advertising standards, client solicitation and fee disclosure) • Segregation of client fund from brokers’ own funds • Best execution requirements for brokers

35. Two issues are particularly salient for Governments and regulators in developing countries. Firstly, the structure of regulation ultimately reflects two related balances, tailored as appropriate to local market conditions. There is a balance between the maximization of

regulatory benefits for market participants against the costs imposed on them in the performance of regulatory functions. Ascertaining the optimal “weight” of regulation depends to a large extent on the level of assurance that market participants require. Markets with well-established practices, relations and goodwill between participants may therefore need a more flexible, light-touch regulatory model than markets in which participants are unfamiliar or uncomfortable with market institutions, counterparties and procedures. A second, related balance is that between external regulation by a governmental authority and self-regulation by the industry or its representative bodies (the latter usually operating under a mandate ultimately laid down by statute or government directive). The latter balance can be seen at an advanced level in the United States (see box 7). Again, getting this balance right is a function of the degree of confidence of both government and market participants in market institutions that could potentially act in a self-regulatory capacity.²⁰

Box 7. Summary of commodity exchange regulatory structures in the United States of America

External regulatory agency: Commodity Futures Trading Commission (CFTC)

Congress created the CFTC in 1974 as an independent agency with a mandate to regulate commodity futures and option markets in the United States. The agency’s mandate has been renewed and expanded several times since then, most recently by the Commodity Futures Modernization Act of 2000. The mission of the Commodity Futures Trading Commission (CFTC) is to protect market-users and the public from fraud, manipulation and abusive practices related to the sale of commodity and financial futures and options, and to foster open, competitive, and financially sound futures and option markets. (Source: CFTC)

Industry self-regulatory agency: National Futures Association (NFA)

Founded in 1982, the NFA is the industry-wide, self-regulatory organization of the United States futures industry. Membership is mandatory, assuring that everyone conducting business with the public on the United States futures exchanges (more than 4,200 firms and 55,000 associates) must adhere to the same high standards of professional conduct. As an independent regulatory organization, it has no ties to any specific marketplace and performs no other activity, either trading or lobbying. Operating at no cost to the taxpayer, the NFA is financed exclusively from membership dues and from assessment fees paid by the users of the futures markets. (Source: NFA)

Exchanges as self-regulatory organizations

Self-regulatory organizations (SROs) (i.e. the commodity exchanges and registered futures associations) must enforce minimum financial and reporting requirements for their members, among other responsibilities outlined in the CFTC regulations. When a futures commission merchant is a member of more than one SRO, the SROs may decide among themselves which of them will assume primary responsibility for these regulatory duties and, upon approval of the plan by the CFTC, be appointed the “designated self-regulatory organization” for that futures commission merchant. (Source: CFTC)

36. The second issue is the role and regulation of speculative participants in commodity markets. On the one hand, speculative interest performs a key role in adding liquidity to commodity futures markets. Without liquidity, futures markets cannot provide an effective environment for participants to hedge their exposure to price risk. On the other hand, the participation of speculative interest – in particular, large institutional investors – brings with it a number of challenges that require partnership between regulators, Governments, exchanges and institutional investors themselves. The regulatory framework must be particularly

²⁰ For a detailed discussion of the role and form of self-regulation, see “Emerging commodity exchanges: From potential to success” (UNCTAD/ITCD/COM/4) and Corcoran et al. (2002).

effective in monitoring the cross-border aspects of institutional investor activities. Specifically, it requires a system of cross-jurisdictional large-trader reporting and the effective sanctioning of institutions that breach market rules. Thus, national regulatory authorities are advised to establish relationships with foreign regulators for information-sharing and cooperation in the development of appropriate frameworks for oversight and enforcement. A second issue is the heavily contested question of whether speculative institutional participants cause price distortions in futures markets. While recent empirical research suggests otherwise,²¹ it is recognized that with active speculators on the market, prices tend to react quickly to new information and often overreact, leading to high short-term volatility, which can pose problems for hedgers in managing their positions properly.

IV. COMMODITY EXCHANGES, REGIONAL INTEGRATION AND SOUTH–SOUTH TRADE

37. A commodity exchange can create markets by providing a forum in which multiple buyers and sellers trade commodity-linked contracts, thus reducing the costs associated with finding a buyer or seller with whom to transact. This logic is perhaps even more pressing when it comes to stimulating international trade, whether regional or global in nature. The transaction costs of conducting international trade tend to be larger, driven by distance, more pronounced information asymmetries, barriers to trade, divergent business practices and cultural and linguistic differences. As a central focus for trade in a given geographical area or jurisdiction, a commodity exchange can establish modalities for the conduct of cross-border transactions and links between commodity-sector participants domiciled in different jurisdictions, thus stimulating regional integration and South–South trade.

Box 8. A regional exchange for Africa: the Pan-African Commodities and Derivatives Exchange (PACDEX)

An African commodity exchange has been cited as an “instrument of integration” by the African Union and its predecessor, the Organization of African Unity, since the Abuja Treaty of 1991. The African Union’s commitment to an African exchange was again reaffirmed in the Arusha Declaration on African Commodities, 2005.

In spite of the African Union’s long-standing commitment, and in contrast to other regions in the developing world, Africa has struggled to create viable exchange structures. Many national-level initiatives have failed. The only successful African commodity exchange that has withstood the test of time has been the JSE/SAFEX exchange in South Africa.

The PACDEX initiative, with high-level support from the African Union and technical assistance from UNCTAD, is pursuing an alternative approach. Instead of a stand-alone national exchange, PACDEX is working towards a regional institution based on a hub-and-spoke franchising model. The hub, based in Botswana, will link together country-specific exchange platforms and warehouses into a coherent regional network. Each country-specific exchange will use a common trading system to match trades from commodity exchanges in different countries, supported by a common “back end” for clearing and settlement of transactions.

²¹ See, for example: International Monetary Fund, *World Economic Outlook 2006*; Weiner RJ (2006), Do birds of a feather flock together? Speculative herding in the world oil market, Resources for the Future discussion paper; Haigh M, Hranaiova J and Oswald J (2005), Price dynamics, price discovery and large futures trader interactions in the energy complex, CFTC working paper. A contrasting view may be found in the United States Senate report, “The role of market speculation in rising oil and gas prices: A need to put the cop back on the beat” (available at www.senate.gov).

This structure is designed to overcome the barrier posed by the high set-up costs that small African markets would otherwise struggle to recuperate, while the common technology platform will generate greater liquidity and price discovery that better enables African commodity producers to market their commodities and manage their risk.

38. Improving the functioning of regional markets has been recognized as an important element of building competitiveness and broadening the impact of commodity-based growth.²² Two main impacts of domestic and regional market formation can be identified. First, regional markets can act as an effective intermediate step for developing-country producers and processors in scaling-up their business operations. Reaching these markets allows for expansion of the volume and breadth of production without also imposing the web of standards and conditions that large developed-market commodity purchasers typically require. The resulting economies of scale can improve efficiency and export competitiveness, while enabling investments to meet the more complex market requirements of purchasers from developed countries. Second, building local networks and clusters among developing-country commodity-sector actors can be a means of building capacity to access global value chains while enhancing resilience to shocks that could otherwise disrupt producers' supply capacity. The clustering of enterprises increases the scale of overall production and enables combined learning and sharing of resources within the cluster. Clustering also makes more viable the often capital-intensive infrastructure development projects necessary to facilitate trade, such as the construction of transportation corridors, as well as the establishment of central support facilities including training, certification and trade promotion centres.

39. Another powerful trend that has been driving the world commodity economy in recent years has been the impressive growth in South–South commodity trade (see table 2).

Table 2. South–South commodity trade by region, 2000 and 2004

Region	Share of commodity exports to developing countries (% of total)		Share of commodity imports from developing countries (% of total)	
	2000	2004	2000	2004
Africa	28	31	33	38
America	23	26	28	32
Asia	44	48	51	55
All developing countries	39	44	45	50

Source: Calculations by UNCTAD secretariat on the basis of Comtrade data.

40. Moreover, South–South commodity trade is projected to continue its impressive rate of growth, driven to a great extent by the emergence of China and India, the largest among a number of fast-growing emerging markets. This new demand has seen prices across almost all commodity sectors surge to record or near-record levels in recent years, generating important revenue uplift for commodity producers situated across the developing world. It is a critical imperative, therefore, to ensure that commodity-dependent developing countries, particularly least developed countries, are able to take advantage of this rising tide. New institutions are required to address an international economy where the dynamic element – and what may soon become the predominant direction – is South–South trade.

²² See for example “Multilateralism and regionalism: The new interface” (UNCTAD/DITC/TNCD/2004/7).

41. A commodity exchange can be a powerful instrument of regional economic integration and South–South trade for four reasons. Firstly, a core function of an exchange is to provide security to the transactions that take place on its trading platform, which makes it much easier for a buyer in one country to enter into a commercial relation with a previously unknown seller in another country. Secondly, it enables commodity-sector participants to discover new markets: the supply and demand situation of a given commodity will become visible for all and the exchange platform should then enable the actual transactions to take place. Thirdly, prices become more transparent, signalling to traders opportunities for profitable price arbitrage through international trade, and allowing farmers to better choose their cropping patterns to meet both the existing and new sources of market demand. Fourthly, an exchange will normally invest in physical market infrastructure, such as grading facilities, information systems and warehousing structures, all of which will facilitate growth in long-distance trade.

42. Policymakers in Africa, Asia and Latin America are now recognizing the potential role of a commodity exchange in integrating regional commodity markets and expanding South–South trade. In Africa, the African Union has long supported the establishment of a regional commodities exchange as an “instrument of integration” for the continent (see box 8). In Latin America, a group of Central American commodity exchanges are exploring the possibility of linking their markets in order to promote regional integration, increase operating efficiencies through scale and consolidate their development efforts. Exchanges in Latin America and Asia have been building links both within and across regions to facilitate expanded trade. For example, Bursa Malaysia is building linkages with exchanges in India and China for the licensing and cross-trading of its benchmark palm oil contract. The BM&F exchange based in Brazil has made it a priority to establish offices in China and is already acting as a “bridge” connecting buyers and sellers in Brazil and China, particularly in the soybean market. The Argentine commodity futures exchanges, the Rosario Futures Exchange (ROFEX) and the Mercado a Término de Buenos Aires (MATba), have been pursuing regional and global linkages as a means of promoting Argentine commodity exports. Meanwhile, many other opportunities exist throughout the developing world, including in Africa and in the least developed countries.

V. CONCLUSIONS AND ISSUES TO BE ADDRESSED BY EXPERTS

A. General issues

43. Commodity exchanges have a potentially important role to play in reducing the high transaction costs faced by entities along commodity supply chains in developing countries. By reducing costs, a commodity exchange can stimulate trade and deliver welfare gains to commodity-sector participants. This is reflected in the recent rapid growth of exchanges in developing countries.

44. *Questions for experts:*

(a) What have been the drivers of growth in recent years for exchanges in developing countries?

(b) In which situations is a commodity exchange an appropriate instrument of policy?

(c) How do commodity exchanges fit within the wider policy framework?

B. Development impact of commodity exchanges

45. Largely driven by advances in information and communications technology, commodity exchanges are moving beyond earlier constraints to become institutional catalysts for upgrading commodity sector performance and integrating supply chains. While a commodity exchange should not be considered a panacea, it can yield a series of multifaceted positive impacts that can change developing countries' commodity sectors for the better.

46. *Questions for experts:*

(a) What scope exists for commodity exchanges to make a significant development impact on the commodity sectors of the developing world?

(b) What have been the experiences of commodity exchanges in different developing geographical areas?

(c) What have been the major challenges and obstacles faced by developing countries' commodity exchanges?

C. Regulation and commodity exchanges

47. Commodity exchanges operate within highly regulated environments. This framework must be robust in order to ensure that markets are fair, efficient and transparent, that investors are protected and that financial integrity is preserved. However, a balance is required between the benefits and costs of regulation, between the degree of external and self-regulation, and concerning the role of speculative interest in the market.

48. *Questions for experts:*

(a) What forms of regulation are appropriate for commodity exchanges in developing countries?

(b) How can the proper balance between regulatory benefits and costs, and between regulatory and self-regulatory structures, be determined in developing countries?

(c) What is the proper role of, and regulatory framework for, speculative interest in commodity futures markets?

D. Commodity exchanges, regional integration and South–South trade

49. As a central focus for trade in a given geographical area or jurisdiction, a commodity exchange can establish modalities for conducting cross-border transactions and establishing links between commodity-sector participants domiciled in different jurisdictions, thus stimulating regional economic integration and South–South trade.

50. *Questions to experts:*

(a) How can commodity exchanges facilitate regional integration and South–South trade?

(b) Where do the greatest opportunities lie for regional exchange development?

(c) What policy and other challenges exist to the realisation of potential gains?

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