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Commodity Markets and Excess Volatility: Sources and Strategies to Reduce Adverse Development Impacts



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**Commodity Markets and Excess Volatility:
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Extended Abstract

Throughout the 1980s and 1990s when many commodity-dependent low income countries faced severe economic and debt crises, the commodity related development issues were not featured in the policy debate, in particular, in official positions taken by the IFIs on resolution of the protracted crises. Over the last decade or so, however, an almost unanimous consensus has emerged that vulnerability to external shocks represents a major factor behind their economic and debt crises since the 1980s and possible risk of developing a renewed accumulation of unsustainable external debt stocks in LDCs. Yet, there appears to be some persistent reluctance on the part of the global policy making community to grapple effectively with commodity related developing issues through instituting a global facility to address excessive volatilities in commodity prices and to overcome the international poverty trap associated with the high commodity export dependence of these economies.

In this paper, we set out to make a case, as well as a concrete proposal, for a global action to mitigate the commodity dependence syndrome found in many CDDCs, whose trade linkages to the world economy are still predominantly through primary commodity exports. Most of them have so long locked into a very disadvantaged position for embarking on a sustainable development path in the absence of appropriate global facilities.

Towards this objective, the paper first introduces the historical debates on commodities and development with reference to these low income countries ([Section 2](#)). It proceeds to discuss the commodity price dynamics over the recent decades in terms of evolving demand-supply market fundamentals as well as the intensifying two-way interactions between the commodity and financial markets as amplifying commodity price volatility ([Section 3](#)). With these historical debates and recent trends as a background discussion, in [Section 4](#), the paper presents a short review of the global environments for CDDCs evolved over the last three decades since the debt crisis broke out in the early 1980s, in which international mechanisms of commodity dependence syndrome- an international poverty trap- has deepened. It is argued that this has acted as an impediment to achieving broad-based economic development in CDDCs. The paper then discusses briefly the evolving governance structures over commodity markets, trade and production both at the global and national levels.

The hypersensitivity to externally originated instability is one of the critical weaknesses of commodity-dependent low income developing countries. An eventual transformation into more diversified economic structures is the real solution to the problems associated with the “commodity- dependence trap”. It is argued therein that developmental problems of these countries could be overcome only through rigorous investment in production capacity and physical and social infrastructures, leading to transformation of their trade and production structures. To this end, we have to develop strong capacity to manage the transition period with commitment to invest in future on the part of both private agents and the states involved so that the process of active learning-by-doing experiences and accumulation is facilitated.

Yet, we also note that the recent development in commodity markets with heightened price volatility as well as the emerging landscape of commodity marketing and production under globalisation tends to discourage the process of learning and accumulation of critical importance for economic development. These emerging conditions call for a new international framework to improve the share of benefits accruing to producers and producing countries from the integration of their commodity sector with the rest of the world. We should create an environment for strengthening international and domestic institutions governing commodity trade and production throughout commodity chains.

Clearly, the rapid increase in commodity price volatility is one of the most worrisome aspects of the recent development in commodity markets with some severe implication for economic development prospects of many CDDCs. Yet, this condition cannot be dealt effectively at the national level in isolation by the CDDCs themselves. This calls for serious rethinking and reappraisal with a view to creating a new international system of managing commodity-related developmental problems that has remained unresolved for more than 60 years throughout the post-war period.

Setting our discussion in this specifically developmental perspective, we suggest that a global facility is required on the two fronts with innovative elements to suit a new challenge facing the global community in the 21st century: a) a set of innovative schemes to reduce excess in commodity price volatility, which are distinctly different from the earlier schemes operated under the International Commodity Agreements of the 1980s; and b) a new compensatory financing facility such as a state-contingent financing facility as a basis for counter-cyclical macroeconomic demand management to facilitate sustainable socio-economic development in CDDCs.

While the *second* global facility is discussed elsewhere, our discussion in this paper is focused on the *first* global facility. In this context, we examine, in [Section 5](#), the mechanisms of how the financialisation of commodity markets with the expansion of derivatives markets have amplified price volatility in excess of what could be explained in demand-supply fundamentals by examining market microstructures.

Based on our detailed discussion, in [Section 6](#), we make a case for innovative schemes to tame excess volatility. We suggest that the scale of *excess* can become so large from time to time that stakeholders in physical commodities could not rely on price signals emanating from markets for making informed decisions concerning future demand and supply developments, including decisions affecting investment and technological progress required for substitution and conservation of resources. In this context, we make a fresh case to tame excessive volatilities in commodity prices in the light of the recent large price swings that have severely strained the global economy and contributed to the current global economic crisis. In our view, the failure of the previous commodity stabilisation schemes through buffer stock management and export quota allocation embodied in the International Commodity Agreements of the 1980s cannot be used as a legitimate and easy excuse for no action.

The paper considers a new generation of innovative schemes with use of a virtual reserve holding of individual commodities or multi-tier transaction tax. These schemes are designed for influencing effectively on traders' expectation formation with regard to price development. In both schemes, the credibility and effectiveness of these innovative

mechanisms would rest on how well the future price development is forecasted in terms of commodity market fundamentals and how closely the moving target zone could be designed and implemented to reflect such an evolution of fundamentals. These requirements demand highly information- and knowledge-intensive activities from those international agencies and institutions to which public confidence in their competence will be bestowed to ensure a success of an operation as part of global public goods provision.

An establishment and successful operation of these schemes would also depend on the political exigency and willingness of the global community to support innovative schemes to reduce excessive price volatility.

1. Introduction

After two decades of low, and at times dwindling, prices in the 1980s and 1990s, many primary commodities had registered a steep price increase since 2002, reaching an all time high in the spring and summer of 2008 with extremely high volatility (see Figure 1). The soaring key commodity prices hit the world economy at a time of the severe financial crisis, triggered by the Sub-Prime mortgage crisis in the US in the background of global macroeconomic imbalance, which has spread to major industrial economies through poorly regulated global financial transactions and systems. The rapidly increasing prices of basic goods such as fuel and food had sparked off social-and political disquiets and unrest across the globe. The rising fuel cost and food shortages hit particularly hard the livelihood of the urban and rural poor in developing countries.

For a year or so since mid-summer 2007, the financial turmoil with severe liquidity crisis and credit crunch was seen to be confined to financial markets and institutions based in the US and Western Europe. The world economy on the whole managed to maintain its momentum on the back of the buoyant economic growth posted by emerging market economies as well as resource-rich developing economies that enjoyed a commodity boom with a longer duration than seen for some decades.

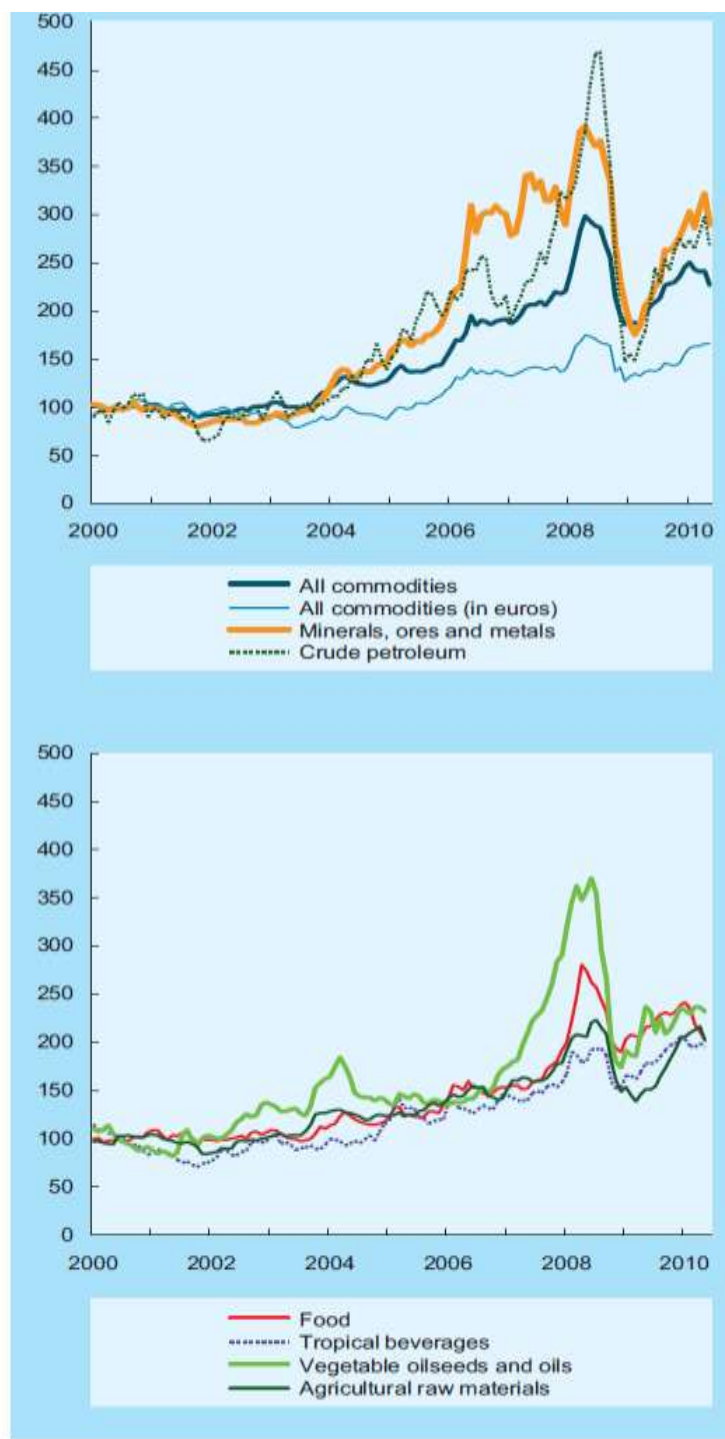
However, by mid-September 2008, the events that hit major financial institutions in the US had altered radically the fate and the course of the globalised economies. The fear of accelerating inflation and fuel and food shortages worldwide had been overtaken by a greater fear of global recession engulfing all economies including those in the developing world. No country has been in a position to remain a mere bystander in the fast evolving financial crisis of global nature. In the last quarter of 2008 and in the first quarter of 2009 the global financial crisis has turned into the globally synchronized recession and economic crisis at a pace inconceivable hitherto as the world trade has rapidly descended into collapse.

In fact, one of the main transmission mechanisms of the global financial crisis of 2008-9 to the developing world has been the commodity market linkage, which has manifested in a precipitous fall in commodity prices across the board in the last quarter of 2008. Along many other producers and traders in developing countries, commodity producers have been hit hard by the credit crunch and the resulting massive withdrawal of financiers from developing countries otherwise untouched directly by the turmoil and crises in global financial markets. Commodity producers are virtually *de facto* participants in the financial markets, as commodities are treated as a critical asset class by financial dealers in their portfolio management through the financialisation link. Therefore, it is essential to consider the likely effects of newly emerging financial sector regulations on commodity markets, and commodity traders and producers.

During the course of 2009-2010, commodity prices generally stabilised following the initial “free fall” and towards early summer of 2010 several “high-profile” commodities regained some of the lost ground and even bounced back nearly to the peak level of the pre-crisis period, creating an anxiety over the possibility of stalling the fragile recovery of the global economy due to rising commodity prices. In particular, the extreme volatility exhibited

during the recent “boom-bust” cycle highlighted clearly once again the high vulnerability of commodity-dependent developing countries (CDDCs) to price shocks emanated from

Fig.1 Monthly Commodity Price Indices by Commodity Group, Jan. 2000-May 2010, (2000=100) Sources UNCTAD (2010b), Chart 1.2 p. 8



Source: UNCTAD secretariat calculations, based on UNCTAD, *Commodity Price Statistics Online* database.

Note: Crude petroleum price is the average of Dubai/Brent/Texas, equally weighted. Prices are in current dollars, unless otherwise specified.

world commodity markets and associated difficulties in managing their economies over the commodity price cycles.¹ In particular, as these economies are typically characterised by high income inequality, the impact of the current global financial and economic crisis on the poor, including those in “vulnerable employment, “working poverty” and “extreme working poverty” have been severe (ILO 2009, UNCTAD 2010b). The eventual cost of the crisis under globalisation is often disproportionately borne by the poor in low-income developing countries (Nissanke and Thorbecke 2006 and 2010).

Amidst the global financial and economic crisis of 2008-9, the plight of low income developing countries (LICs) received much needed attention from policy-makers around the world, recognized as an innocent victim of the large-scale gambles taken by financial institutions in the West. In order to avoid the repetition of the catastrophic transmissions of the financial crises spilling over into world trade and real economic activities, reforms are required not only to the global system of financial regulation and bank supervision but also to governance structures over the globalisation process as a whole, including those affecting world commodity markets and trade.

Indeed, rigorous and comprehensive analyses of the interface between commodity and financial markets are of critical importance, as the volatility in the commodity markets and in the financial markets can potentially feed on each other and constitute an inbuilt mechanism of short-term destabilization and uncertainty in the world economy. The simultaneous appearance of severe strains in both commodity markets and financial markets in 2007-08 cannot be treated as a mere coincidence. Hence, reform programmes would not be complete without a deeper understanding of how the recent developments in commodity markets and financial markets have interacted to exacerbate the instability in the global economy, and their implications for international trade, finance and economic development, in particular for commodity-dependent low-income developing countries (CDDCs). Given the fragile nature of their institutional and socio-political environments in the early stage of economic development, low-income countries (LICs) and the poor in these countries are most vulnerable to such global shocks.

With this background, the objectives of this commissioned paper are to address the following core issues:

- i) price dynamics of primary commodities over the recent decades in a historical context and their implications for the economic management of commodity dependent developing countries;
- ii) factors behind excess volatility of commodity prices in the light of commodity market fundamentals and the effects of financialisation on commodity markets;
- iii) persistence of commodity dependence as a development trap, and fundamental factors giving rise to this trap;
- iv) today's public debate on vulnerability of commodity dependent developing countries, including proposals for new architectures for reducing excessive price volatility in commodity markets and other mitigation measures to address commodity related vulnerabilities of CDDCs.

¹ In literature, a clear distinction is not made in classifying countries into Low Income countries (LICs),

Towards achieving these objectives, the paper is structured as follows: Section 2 introduces the historical debates on commodities and development with reference to developing countries. Section 3 presents commodity price dynamics over the last decade with reference to two conditions – structural changes in market fundamentals and increasing interactive activities between financial and commodity markets. Section 4 discusses international environments for generating the ‘commodity-dependence trap’. Section 5 examines the mechanisms of how the intensifying financialisation of commodity markets with the expansion of derivatives markets has amplified volatility of commodity prices in excess of what could be explained in demand-supply fundamentals of individual commodities. It presents detailed discussions on structures of commodity markets as asset markets. Section 6 discusses rationale and proposals for innovative commodity market management schemes, focusing on their differences from the earlier schemes operated under the International Commodity Agreements of the 1980s. Section 7 offers concluding remarks discussing implications of the recent development in commodity markets and trade for economic development in commodity dependent developing countries (CDDCs) and possible initiatives of the international community in this regards.

2. Commodity Prices and Economic Development: a Debate in a Historical Retrospect

Historical debate on commodity prices and empirical evidences

Historically two questions have dominated the discussions in literature on primary commodity prices in development economics: i) the declining terms of trade in commodity export prices relative to imports of manufactured goods from developed countries (the Prebisch-Singer hypothesis), and ii) the high price volatility and instability. The early debate on trade and development and the North-South economic relations in the post-war period was largely shaped by these two questions, as they have had a profound effect on the course of economic development and management of commodity-dependent low income developing countries.

The long-term declining terms of trade of primary exports were explained by Prebisch (1950) and Singer (1950) in terms of the fundamental differences between primary commodities and manufactured goods both on demand and supply sides. The Prebisch-Singer hypothesis, as known in literature, is built on conditions such as: i) the low price- and income-elasticities of demand for commodities as compared with manufactures; ii) the technological superiority of developed countries over developing countries; iii) the dominance in economic power relationships of the former, which allows transnational corporations to capture excess profits; and iv) the asymmetric impact of labour union power in developed countries and labour surplus in developing countries on the division of the benefits of increased productivity.

Turning to these fundamental factors affecting commodity prices, Maizels (1987, 1992 and 1994) explains the sharp decline of terms of trade for primary commodities in the 1980s in terms of the structural shifts in the demand and supply relationships in primary commodities. These are not only due to the nature of technological changes, but also as a consequence of the two oil shocks and the commodity booms in the 1970s and the subsequent deep recessions following contractionary macroeconomic adjustments to major industrial economies and the ensued debt crisis that gripped the developing world.

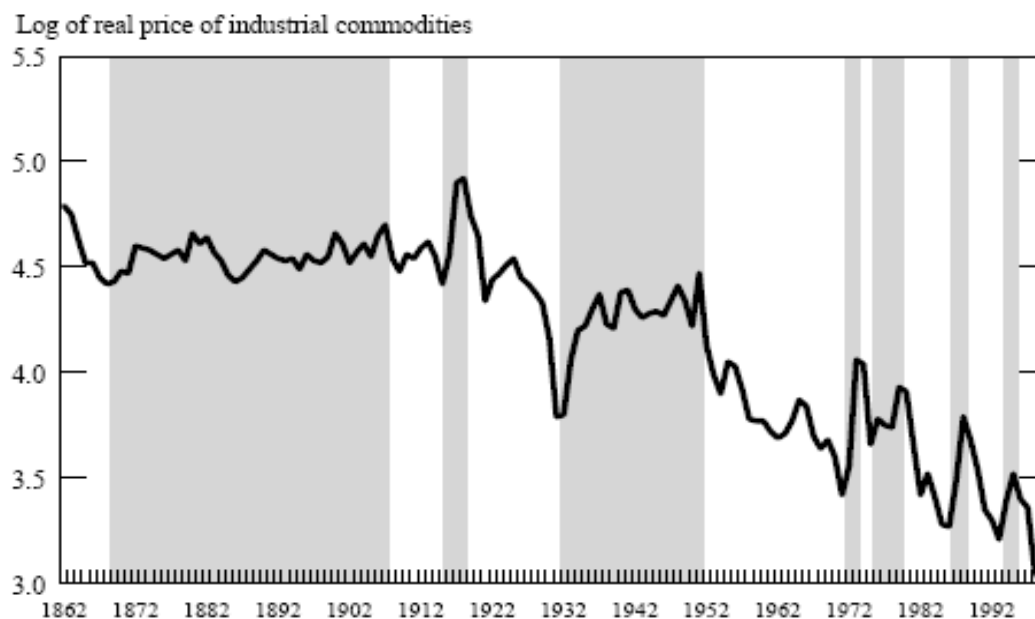
In a similar fashion, large fluctuations characteristic to commodity prices can be explained in terms of frequent shocks to the fundamental demand-supply relationship of physical commodities. Specifically, “because of the low *short-term* price elasticities of both supply and demand for the great majority of primary commodities, any given disturbance in economic activity in the developed countries, or in commodity supply, results in a greater than proportionate change in commodity prices and export earnings of commodity-dependent economies”(Maizels, 1994, p.1692). Typically, for example, exogenous shocks on supply side set-off a price cycle over medium-term, if the size of shocks is such that it cannot be absorbed through inventory adjustments. The duration and amplitude of the price cycle is in turn determined by the way supply would respond to the initial shock as well as the speed of adjustments on both demand and supply sides.

At the same time, as CFC (2006) notes, undifferentiated basic commodities such as tropical beverages could also exhibit a tendency to structural over-supply or over capacity from

time to time. Such over- supply condition, especially a simultaneous export expansion of basic commodities in a number of key producing countries would depress prices in world markets, as the ‘fallacy of composition thesis’ implies. Such a condition prevailed for several commodities in the 1980s and 1990s, when export growth was encouraged concurrently across commodity producing countries as a way out of the debt crisis under the Structural Adjustment Programmes. The over-supply conditions could not be attenuated through effective international coordination over prices and supply, as the International Commodity Agreements had become, as discussed below, defunct over time during this period.²

However, shifts in the supply-demand relationships, such as those described above, have become less effective on their own for explaining the ever-increasing volatilities in price movements, observed systematically across a large number of commodities, in particular large fluctuations found in high-frequency price data. Already in the early 1990s, there was evidence showing that the high price volatility could result from the intensifying two-way interactions between the commodity and financial markets. Whilst speculative activities in commodity markets exacerbate price volatilities, key financial variables can also influence the volume of commodity stocks held and hence price dynamics over short-run. Thus, “instability in the commodity markets and in the financial markets feed on each other, and constitute an inbuilt mechanism of short-term destabilization and uncertainty in the world economy” (Maizels 1994, p.1692). This two-way interaction has been further intensified over the last two decades, and the pace of financialisation of commodity

Fig.2 Historical Trend in Real commodity Prices



Source: Source: Cashin and McDermott (2002, Figure 6)

produced both in developed and developing countries, are increasingly attributed to large-scale agricultural subsidy programmes which have long been in place in developed countries such as the US and EU.

markets has significantly accelerated in the 2000s, as commodities form a critical part of investors' asset portfolio, as discussed in detail in Section 3 below.

Indeed, several earlier statistical analyses which examined historical time-series data of commodity prices up to the 1990s such as Deaton (1999) and Cashin and McDermott (2002), consistently show that large commodity price cycles have become more frequent with shortened duration and increased amplitude over the recent decades. For example, analysing the behaviour of *real* commodity prices over the period 1862-1999, Cashin and McDermott (2002) find that i) large price volatility dominates the relatively small secular decline in real commodity prices; and ii) the real commodity index fell by four-fifths between 1900-1999, ending the century at a record low, with an increasing annual volatility and much shorter price cycles under the flexible exchange rate regime of 1972-99 (Fig,2).

International Commodity Policies in the early years

In the first three decades of the post-war period, the focus of the academic and policy discussions on the commodity problem was mainly on short-term price instability and its effects on export earnings and income of low-income developing countries. Hence, the intergovernmental intervention during those early decades was also centred around measures to reduce excessive instability or to offset its effects on income of producers and producing countries.

Indeed, with a deep understanding of destabilising forces stemming from the close links between commodity price dynamics, on the one hand, and financial and macro performance in the world economy, on the other, Keynes elaborated the critical importance of establishing a buffer stock scheme for the main traded commodities in his writings with reference to the Great Depression in the 1930s and in his wartime proposals (Keynes, 1938 and 1942). He advanced an active buffer stock management as a means to reduce commodity price fluctuations and to dampen the trade cycle, and hence, as a *countercyclical* mechanism of a world income-stabilisation scheme.³

Having faced strong opposition from the US administration in the intergovernmental negotiations, however, Keynes's proposal in the original form did not survive as a part of the post-war architecture of the international economic system. Instead, after laborious negotiations over many years, the Integrated Programme for Commodities was finally adopted in the Nairobi Resolution of UNCTAD in 1976, where a blueprint of the International Commodity Agreements (ICAs) emerged in a much less ambitious form than envisaged in Keynes' original proposal. Consequently, the ICAs were established for a number of commodities (Cocoa, Coffee, Rubber, Sugar and Tin). The objectives of these ICAs were invariably to stabilize excessively high price fluctuations and export earnings by defending floor and ceiling prices within a band through financing centrally held buffer

3. Keynes' idea was subsequently developed into commodity stabilization policies by Richard Kahn, who emphasized that the aim of stabilization policies is to curb irresponsible movements of the price rather than to establish stability within a narrow range of fluctuations. For discussion on the main ideas behind the proposals advanced by Keynes and Kahn, see Fantacci et al.. (2009).

stocks or export controls on a basis of predetermined quota assigned to each producing country (Maizels 1992).

However, by the end of the 1980s, with the exception of the International Natural Rubber Agreement (INRA), all the ICAs had broken down, lapsed or have been suspended. The INRA operated through buffer stocks was also finally abandoned in 1999. One of the major difficulties faced by the ICAs was undoubtedly a fundamental disagreement and divergence of interests between developing exporting countries and developed importing countries over the objective of price stabilization agreements. Apart from typical problems associated with collective action involved in international corporation agreements, there was not much political or financial support from the international community for sustaining the agreements.

In addition, the ICAs suffered from a number of serious technical problems associated with their implementation. For example, a major difficulty in implementing and maintaining a buffer stock stabilization scheme was in setting an appropriate price around which stabilization should take place (Deaton and Laroque 1992; Maizels 1992, 1994). For many commodities it was not easy to establish uniformly such a price band due to heterogeneity and qualitative differences among the commodities being traded (e.g. different grades of coffee and cocoa) across different locations of exchange markets (Gilbert 1987). A difficulty arose also in agreeing over the level and the band-width around which prices are supposed to be stabilized. While the main interests of developing producing countries lie in defending ICA “floor prices” at times of price decline, developed consuming countries insisted that ICA price ranges should be reduced in line with market trends, reflecting changes in the structure and cost of production and distribution or changes in consumer tastes. The latter argued for the need for appropriate flexible adjustment to the level and the width of floor and ceiling prices over time along market trends.

Further, even if the stabilization range is appropriately defined, the resource requirements to maintain such a buffer stock scheme are high owing to the nature of commodity price cycles (Gilbert 1996). Deaton and Laroque (1992) suggest, for example, that commodity prices exhibit long flat bottoms punctuated by occasional sharp peaks. This means that stocks have to be held for long periods in order to deal with low prices, while at times of price peaks stocks are likely to be depleted quickly unless supply capacities can be increased fast.

Likewise, a system of export quotas – the other mechanism popularly used in the ICAs – gave rise to several technical problems in managing and policing agreed quota. According to Gilbert (1987), the problems stem from the use of historically determined quotas. In particular, the predetermined allocation of export quotas across producing countries tends to freeze the existing distribution of production, and hence, it fails to allow for future relative positions of exporting countries in their production capacity and competitiveness. Consequently, countries with rapidly expanding production have a disincentive to membership, while member countries would have also an incentive for rent-seeking activities, and/or illegal or quasi-legal evasion. In addition, the system encourages countries to over-export in non-control periods in order to establish larger quota entitlements.

In short, the ICAs operated in the past were obviously not well designed to deal with these collective action problems as well as underlying long term forces such as persistent

oversupply or the effects of the “residual” free market operations. To overcome these difficulties, Maizels (1994) discusses possible alternative measures and their advantages and disadvantages compared to traditional schemes involving buffer stock management or export quota. Given the difficulty in reaching agreements with developed consumer countries, for example, producer-only supply management can be considered. However, because of the substitution effect from competing synthetics or other substitutes, this is feasible only for a limited number of commodities such as tropical beverages (coffee, cocoa and tea) or natural rubber (Maizels, Bacon and Mavrotas, 1997). Hence, in his view, supply management does not constitute a viable option for a large number of commodities. He also suggests a uniform *ad valorem* export tax in place of export quota for eschewing difficult negotiations on market share. However, he foresees that export tax required to have a necessary effect on prices may be too high for commodities for which the short-term price elasticity of demand and/or supply is low. He was also well aware of strong opposition from the IFIs and developed consuming countries to any intervention in world commodity markets on the ground of market efficiency arguments.

It is worth noting here that while the Common Fund for Commodities (CFC) was established to reduce the cost of buffer stock operations by the ICAs, its resources never reached the volume sufficient to fulfil its purpose. Furthermore, since there have no substantive new proposals for addressing the technical issues associated with existing schemes and, more generally, the issue of how best to deal with market volatility, the CFC has not been able to deal effectively with operational and other practical problems the ICA faced. General disillusionment with the system of buffer stocks has prevailed since then. This has resulted in reduced interest in addressing the issue of price volatility at [source](#). Instead, the attention of policy makers in the development community has increasingly turned to reactive measures to mitigate the negative impact of volatility through some targeted interventions at the level of vulnerable groups within the general poverty reduction framework and debate.

Furthermore, with the collapse of the ICAs behind, the use of market mechanisms for managing commodity price risks has been advocated by the international donor community for dealing with risks stemming from large price volatility and accompanying income shocks in the CDDCs. IFIs have actively encouraged primary commodity producers to use market-based commodity-linked financial risk-hedging instruments by participating in futures and derivative markets. However, the use of financial instruments for hedging risks is both costly and not effective for the CDDC, not only at the macro level as counter-cyclical management but also at the micro level for farmers and local producer and trader associations, as discussed below in Section 4. As revealed in the CFC study (Zant, 2009) the outcomes of the pilot project on cocoa price risk management confirm that hedging risks proved difficult and costly using these instruments.

We also note here that at the global level, apart from the ICAs, there were also a number of compensatory facilities to offset shortfalls of commodity export earnings such as the Compensatory and Contingency Finance Facility (CCFF) by IMF and the STABEX by EC (Maizels 1994, Hewitt, 1993 and 2010). However, those operated in the past are not well designed and structured rather inappropriately to meet effectively the need facing the LICs and CDDCs. The original IMF Compensatory Financing Facility (CFF) was established in 1963 as a low-conditionality semi-automatic mechanism for temporary balance-of-

payments support, but unfortunately available on a non-concessional basis. So it was not suitable for low income countries at times of their balance-of-payment crisis, though it was popular among middle-income countries. The CCFF – a non-concessional facility established in 1988 to replace CCF – has become so highly conditional upon accepting pro-cyclical demand management that very few countries have turned to it for assistance since its inception. The Exogenous Shock Facility – a concessional loan facility for countries under the IMF's Poverty Reduction and Growth Programme established in 2000 – has continued to carry high policy conditionality to make it less popular and accessible to LICs than otherwise.

Similarly, the STABEX has met rather limited success because of its pro-cyclical disbursements due to the long time lags from income shocks for delivery of compensation. Further, since the compensation under the STABEX was delivered in the form of grants only to agricultural sectors affected by income shocks, it has been argued that there was a diversion from other forms of ODA and the STABEX tends to discourage diversification efforts.⁴ FLEX, which replaced STABEX and SYSMIN under the Cotonou Agreement of 2000, has been under criticism for slowness of disbursements and resource constraints so far.

⁴ Compensation for mineral products was administered under a separate facility- SYSMIN.

3. Changing Structures in Commodity Markets

The Recent Commodity Boom –Bust Cycle

The marked price increases began to gather pace first in 2002-3 and then in 2006-7, culminating in the all-time high peak in spring-summer of 2008 across commodities. The boom lasted nearly six years up to the spring and summer of 2008, which was longer and stronger than any other boom in the last century (Fig,1). Table 1 presents summary statistics on the scale of the price boom and bust of 2002-2008.

Further, Table 1 presents summary statistics on the scale of the price boom and bust of 2002-8, experienced by different commodity groups, reported in UNCTAD (2008c).

Table 1 Monthly average world primary commodity prices, 2002-2007, 2008 (Percentage change over previous year monthly average)

Commodity group	2002-2007 ^a	2008 (1 st half) ^b	2008 (2 nd half) ^c
All commodities (excluding crude petroleum)	113	34	-35
Food	65	51	-31
Tropical beverages	67	24	-15
Vegetable oilseeds and oils	93	-	-48
Agricultural raw materials	80	26	-25
Minerals, ores and metals	261	18	-41
Crude petroleum	185	52	-50

Source: UNCTAD secretarial calculations based on UNCTAD Handbook of Statistics 2008 and UNCTAD Commodity price statistics

Note: Price in current dollars

^a Percentage change between 2002 and 2007

^b Average monthly prices for half of 2008 compared 2007 monthly average

^c Percentage change from the peak monthly price recorded in 2008 in comparison with the November 2008 monthly price

Source: reproduced from Table 1 of UNCTAD (2008c)

According to Table 1, the nominal price index of non-fuel commodity increased by 113 percent, while that of crude petroleum - 185 percent for the five year period of 2002-7. The prices of minerals, ores and metals experienced the steepest rise of all - 261 percent over the same period. Among agricultural commodities, prices of vegetable oilseeds and oils had a steeper increase of 93 percent, followed by agricultural raw materials (80 percent), tropical beverages (67 percent) and food (65 percent).

The commodity price increases further accelerated in the first half of 2008. The non-fuel commodity prices registered an average monthly price rise of 34 percent over the one in 2007. The steepest increase in the first half year of 2008 was for crude petroleum (52 percent) and food (51 percent) – politically sensitive consumer goods. Prices of other agricultural commodities also increased by around 25 percent, though the prices of minerals and metals started easing off.

However, as the unprecedented turmoil and meltdown in financial centres across the globe hit the news headlines and the pessimism about the prospects of the world economy started dominating after September 2008, prices across commodities plummeted sharply, as shown in Fig.1 and Table 1.

Oil prices fell from over \$140 dollars posted in early July to below \$50 in November-December, 2008, and to \$35-\$45 in February, 2009. A similar dramatic fall was reported for a number of metal prices such as nickel, zinc and copper due to immediate and impending reduction in world demand, notably, a drastic deterioration in global prospects for construction and automobile industries. Grain prices also declined significantly from the hike in the first half of 2008, recording a fall by more than 30 percent from April 2008 to November 2008. For example, wheat prices fell from \$440 a ton in March 2008 to \$240 a ton in November 2008, while rice prices fell from \$1,000 a ton to \$550 a ton for the same period. In the early December, 2008, the World Bank noted that commodity prices had lost, in a matter of two months in the last quarter of 2008, most of the increase of the preceding 24 months (World Bank 2009).

Commodity prices stabilised in the early 2009 and began to recover the lost ground partially in the second quarter of 2009 while the global economy was still in a deep recession. It has led to an IMF report to observe that the recovery in commodity prices has been faster in the current economic cycle than in the previous ones, whilst the fall in prices was by far the steepest compared to the previous five recessions across commodities (Table 2 and Fig. 2).

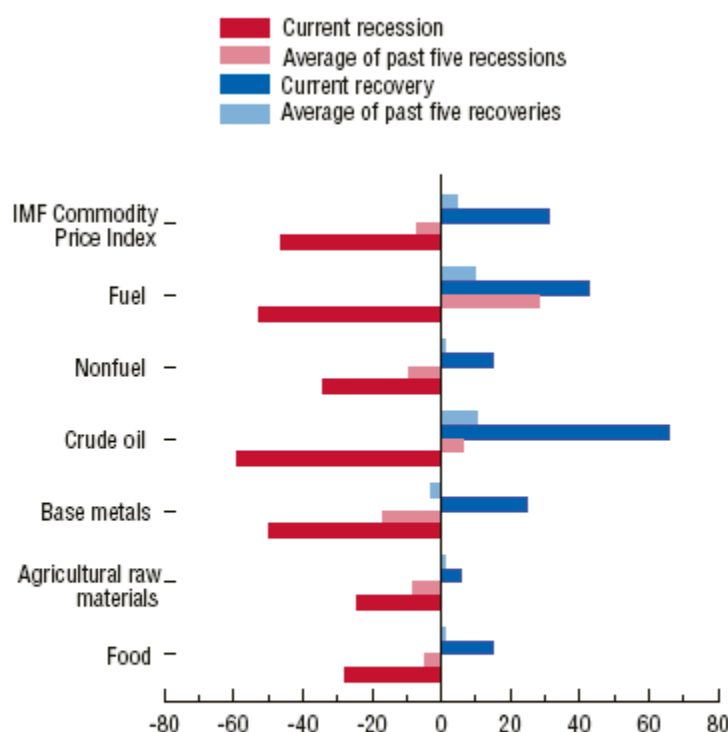
Table 2 Commodity Price Developments, 2008-9

	Percent Change		
	Peak to trough	Trough to June	2009:Q2/ 2009:Q1
IMF Commodity Price Index	-55.6	31.1	15.7
Fuel	-64.1	42.7	20.1
Petroleum	-68.7	66.4	33.8
Nonfuel	-35.5	17.5	9.5
Base metals	-49.6	24.5	15.1
Agricultural raw materials	-33.0	13.6	0.7
Food	-33.4	19.6	10.2

Source: IMF, Primary Commodity Price database.

Source: IMF (2009), Table 1.2

Fig. 2. Commodity Prices in Global Recessions and Recoveries
(Percentage change indices, 2005=100)



Sources: IMF Primary Commodity Price System; and IMF staff calculations.

¹Global recessions and recoveries are identified on the basis of monthly peaks and troughs in the log level of a monthly index of global industrial production.

Source: IMF (2009), Figure 1.17

After some stability returning to commodity markets, there was a great temptation to be complacent, and to continue to conduct business as usual without conducting any serious inquiry into why commodity prices have increased the degree of volatility so much over time. Such complacency cannot be justified as volatility has begun to resurface in 2010. Indeed, in order to eschew a repetition of the global crisis that has inflicted a huge collateral damage to growth, investment and socio-economic development in the global economy, and above all, to the most vulnerable poor in the developing world, it is critical to examine factors and mechanisms behind such a big price swing in prices and to evaluate whether there is a case for reforms with commodity markets operation, alongside other asset markets.

Changing Market Fundamentals over the last decade

The synchronisation of strong commodity prices of 2002-8 indicates that certain common factors are likely to be responsible for the price escalation across primary commodities at large. It is by now widely accepted that the recent commodity price increases and the emerging price dynamics over *medium term* reflect the profound changes in fundamental

demand-supply relationships affecting simultaneously many primary commodities. In contrast to the earlier price cycles, which were typically triggered by supply shocks, the recent structural changes are known to be mostly found in the “Asian Driver” Story on the *demand* side. For example, the sharp increase in prices of mineral and metals is known to be driven by an upsurge in demand for these commodities from newly industrialising emerging economies, in particular, from the two most rapidly growing economies in the South - China and India - due to intensive use of these raw materials for their industrialisation drive, physical infrastructure building and urbanisation trends (Kaplinsky, 2010).

Similarly, there has been a steady increase in demand for many agricultural products in growing emerging market economies, pushing their prices to rise, though the effects of increased demand from Asian emerging economies for agricultural commodities were felt with a time lag of a few years than for oil, minerals and metals. Substantial increases in food consumption and changing patterns in composition associated with rising per capita income have turned a number of these countries substantial net importers of agricultural products. For example, China has become a significant net importer of many agricultural products, including grains, soya beans and vegetable oils as well as raw materials such as cotton and rubber. Its increased demand for agricultural products is seen as a factor on the demand side that has contributed to the steep rise in the prices of foods and other agricultural raw materials on world markets in 2007-2008. According to Goldstein et al. (2007), for example, all the increase in cotton demand over recent years is accounted for by the increase in demand from China.

Further, we can note some common threads on the supply side too. Minerals, metals and oils are known to hit supply constraints in meeting the fast growing demand, as investment in these sectors were subdued for some time due to the historically low commodity prices in the previous decades. Further, as noted in World Bank Development Report 2007, agricultural production has long been neglected with low investment in agricultural technology and supporting infrastructures in many low-income developing countries, which were hit hard by the recent rising trends in world food prices (World Bank, 2007). Agricultural production in many poor countries suffered also from institutional vacuums created by the economic reform programmes in the 1980s and 1990s.⁵

A common observation can also be made with regard to inventory/stock management. The sharp price increases in 2007-8 in main food crops took place in the background of very low world stocks for major crops such as wheat, maize and rice (UNCTAD, 2008b). Many governments run down grain stocks in the period preceding the food crisis in order to reduce the cost of storage. Similarly, the level of inventories was also running low when the recent sharp rise of metal prices took place in 2005-07.⁶

5 . See Nissanke (2010a) for a detailed discussion on this with reference to coffee and cotton producers in Tanzania.

6 This role of stocks can be also detected by ARCH and GARCH analysis, through the EGARCH coefficient, which shows an asymmetry in the relationship between stock and price, which is typical of metals. When stocks go down the price increases, yet when stocks increases the price is kept stable.

There are also close interlinks between oil prices, on the one hand, and agricultural and other commodity prices in world markets, on the other, through associated higher transport costs and other input cost for their production and marketing. The high correlation between metal prices and energy prices is due to the high energy intensive technology used both in mineral production/extraction and in the metal sector. At the same time, there is a special twist in their link between the rise of oil prices and that of food prices in the recent episode. For example, the dramatic price increase in food prices, which doubled between January 2006 and May 2008, is known to be associated with the abrupt shift in arable land use from food crops towards bio-fuel crops such as vegetable oilseeds and oils in a number of developed economies with agricultural surplus in the face of soaring fuel prices. Subsidies available for converting maize to ethanol in the US are reported to have encouraged this process. Vegetable oilseeds and oils had seen an equal dramatic increase, if not more, as food crops. Climate change, intensified by soaring global fuel consumption, also affected adversely agricultural production in many countries. Finally, policy measures such as export ban and other trade restrictions taken by several food exporting countries at the height of the world food crisis in 2008, triggered by standard supply shocks in grain production such as draughts or poor harvests, have aggravated the situation, sending prices of staple goods such as rice skyrocketing high.

Taking into account various factors influencing fundamental demand and supply relationships, many observers concluded that most commodities such as minerals, metals and oils had entered into a *super-price cycle* in the early 2000s. In particular, given that the recent boom is associated with more permanent shifts in demand, originating from thirst for mineral resources and agricultural products by the Asian drivers, in contrast to the past booms often triggered by temporary supply shocks, it was argued that commodity prices would remain high at the level observed in 2007-08 until supply capacities catch up sufficiently with rising investment in their extraction/production, induced by the recent commodity boom. It was also predicted that while food crisis could ease off slightly in so far as quick adjustment could be made to increase annual food crop production, excess demand could persist over medium term as some of the supply side-factors were found to be not necessarily of temporary nature.

With these expectations prevalent still in summer 2008, many were caught by surprise when commodity prices experienced such a precipitous fall in the second half of 2008 at the onset of the deepening global financial crisis, as shown above. The sharp simultaneous fall in prices across commodities was a reflection of the actual and expected shift in demand-supply relationships as a marked decline in global aggregate demand with the deep recession was seen inevitable with the deepening recession gripped by the world-wide credit crunch and crisis in confidence. In particular, investors and traders on commodity exchanges undertook a swift revision of expectations regarding the growth prospect of emerging market economies in Asia. The latter countries, which were very much behind the “commodity boom” of 2002-08, looked suddenly very fragile indeed, as these economies were known to be heavily dependent on world demand and trade.

In this connection, we suggest that it is the swift change in market sentiment resulting from the sharply increased uncertainty regarding the growth prospect of the world economy that has led to the “free-fall” in commodity prices in the wake of the financial meltdown in September 2008. The crisis of confidence that seized upon the global financial system

prompted investors to seek “safe” investments with fast increasing liquidity premiums. The resultant flight *en masse* to the “quality”- highly liquid assets - by financial investors has led to deleveraging in a massive scale and a sharp drop in liquidity in other asset markets, including commodity markets, and the subsequent collapse in world trade and economic activities. What was observed is a typical process of “self-fulfilling” crisis whereby agents’ expectation in assets markets would produce an eventuality of the expected events and the immediate collapse of real economic activities, as described in a number of currency crisis models (e.g. Obstfeld, 1996).

Consequent upon the combined effects of the fast turn-around in market sentiment and the anticipated reversal in supply-demand dynamics, there was a massive liquidation of long positions in commodity futures markets and the OTC deals, leading to a precipitous fall of commodities across the board. After huge deleveraging on the part of portfolio investors for two months, commodity prices have somewhat stabilized in December 2008 and a further stockpiling of inventories of a number of strategic commodities resulted in some rebound of their prices in the first half of 2009, even though the world economy was still in a deep recession. Since the mid-2009, prices of several commodities such as minerals and metals, oil and agricultural raw materials bounced back strongly (Fig.1 above). UNCTAD (2010b) attributes this rebound mainly to robust demand from emerging market economies. In particular, the faster recovery in commodity prices in 2009 noted above was mainly facilitated by China’s strong demand due to its massive fiscal stimulus package and strategic reserve accumulation on the part of Chinese authorities as well as inventory replenishment by private operators. Both are known to have taken advantage of the lower prices prevailed during the world recession.

Increasing Participations of Financial Investors in Derivative Markets

While there have been certainly structural changes in market fundamentals, a frequently asked critical question is whether ever-increasing volatilities systematically observed in co-movements across a large number of commodities can be explained simply by shifts in supply-demand relationships on their own. This issue has drawn increasing attention because the high price volatility could result from the intensifying two-way interactions between the commodity and financial markets (Maizels, 1994).

It is true that financial investors have historically always been active in holding commodities as a part of their portfolio as Keynes (1938 and 1942) observed. However, it is their increasingly prominent presence in commodity *derivatives* markets and dealings that has changed the way their participation influences commodity price dynamics. In particular, it is fast expansion of liquid commodity derivatives have provided investors with ideal and cost-effective means to include commodities in their portfolio without bearing the cost of holding commodities physically.

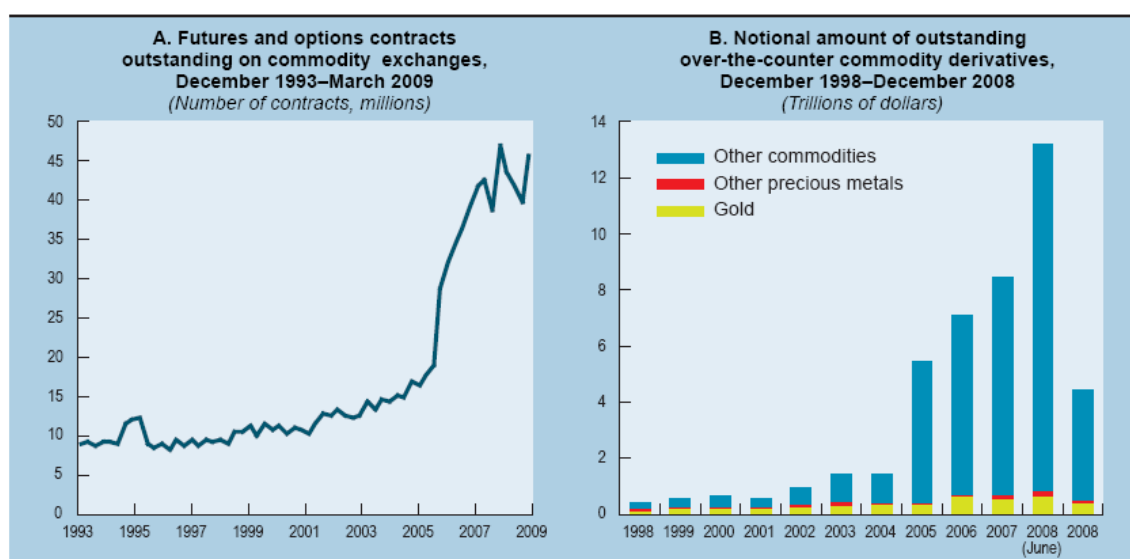
In this context, it should be noted that the heightened price volatility over time since the collapse of the International Commodity Agreements in the late 1980s has led to a rapid expansion of derivatives markets across commodities, as demand for risk hedging instruments has intensified. The rapid growth of derivatives markets has subsequently attracted new players - financial investors who are not engaged in the trade of physical commodities - to the trading floors. Already in the early 1990s, there was a marked shift of

speculative funds into, and out of, commodity markets in dealing with futures contracts in coffee, cocoa, sugar, copper, lead, tin and zinc etc. Their active participation in derivative markets and dealings has resulted in a radical change in the structures of trading on commodity markets, leading to a loosening of the relationship between derivatives markets and physical markets.

Generally, financial investors enter the commodity markets with a view to obtaining an optimal risk-return configuration from different assets through portfolio diversification. In particular, they can make good returns on high asset price volatility, inclusive returns in commodity markets, in search for high risk premium by taking a speculative position on volatile prices. The resulting growing interlinked activities between commodity and financial markets by portfolio investors through derivatives markets and dealings, to which we specifically refer as the financialisation process of commodity markets, has further accelerated over the last decade or so, when commodity derivatives markets have experienced an explosive growth. Basu and Gavin (2011) advance two hypotheses for this phenomenon: i) commodity futures are thought as offering hedging opportunities against equity risk given a *perceived* negative correlation between returns on equity and commodity futures (the Hedging Hypothesis); ii) commodity derivatives, are generally used as a vehicle for obtaining higher yields from riskier assets in a low interest rate environment (the Search for Yield Hypothesis).

Indeed, a rapid explosion of derivatives markets during the past decade took place after the severe downturn in equity markets of 2000-2002 triggered by the burst of the dot com bubble. Financial institutions and private investors operating globally switched to target many commodity markets, including copper, coffee, cotton, along with oil and gold, as part of their asset portfolio diversification strategy from equity and bond markets. As shown in

Fig.3. Rapid Expansion of Commodity Derivatives Contracts



Source: UNCTAD Trade and Development Report (2009) Chart 2.1, originally from BIS, Quarterly Review, June 2009

Fig.3 and 4., the year 2002 saw a marked increase in trading in commodity derivatives associated with the launch of numerous commodity index funds, attracting keen interests on the part of international financial institutions and private investors. This trend accelerated in 2007-08 as the crisis unfolded in financial markets in the US and Europe, as a flight from equities and bond markets as well as housing mortgage markets to commodity markets had taken place on a large scale (Fig, 3).

UNCTAD (2008b) presents various estimates indicating the big jump in derivatives trading, when prices across commodities hiked in 2007-08. For example, according to the Bank of International Settlements (BIS) estimate, outstanding amounts of over-the-counter commodity derivatives increased by more than 14-fold to \$13 trillion between 2002 and June 2008 (Fig.3-B). The deregulation of position limits previously imposed on investment banks in OTC commodity swaps transactions by the Commodity Futures Trading Commission (CFTC) in the US has contributed to this expansion. The growth of agricultural futures and option trading was 32 percent up in 2007, whereas the corresponding growth of energy and industrial metals was in the range of 29-30 percent. Further, derivatives trading activities in petroleum oil were reported to have increased 30 to 35 times more than physical petroleum trading between 2000 and 2006.

Financial institutions such as pension and hedge funds and sovereign wealth funds have become significant players in commodity markets of futures and options (UNCTAD 2008b). As major currencies were experiencing wild swings, many commodities appeared to have provided investors with a vehicle for inflation- and currency-hedging. Prices of various commodities have become highly correlated as consequence of much of the derivatives trading done in index trading of a bundle of commodities. UNCTAD (2008b) reports that the investment in commodity *indices* surged from less than \$13 billion at the end of 2003 to \$260 billion in 2008, constituting about a quarter to one third of the notional amounts of commodity futures.⁷ There are several features specific to commodity index trading. First, as Masters and White (2008) argue, commodity index funds are created and specifically as vehicle for speculation on price movement in commodity futures, not as an investment vehicle typical to other financial futures, underlying assets of which offer returns in the form of dividends, interests, rents or income streams from equity holdings. Further, commodity index traders tend to take continuously a long position in futures markets by gaining the roll return and pushing futures prices up in a unidirectional fashion in the process,⁸ These factors combined are likely to have in turn contributed to price volatility and driven many commodity prices to historic highs in the first half of 2008.

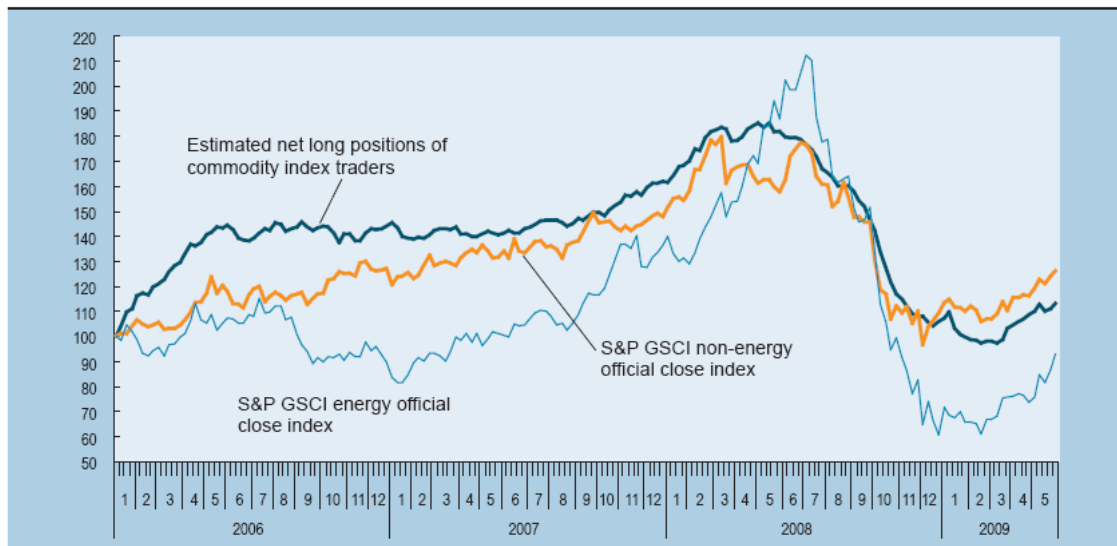
In the down turn, the dramatic decline in the outstanding OTC commodity derivatives and index trading during the last quarter of 2008 has clearly contributed to the sharp fall in commodity prices observed for those months as discussed above (Fig.3B and Fig.4).

7 . The Standard & Poors - Goldman Sachs Commodity Index and the Dow Jones -AIG Commodity Index are the most popular commodity indices: the former's market share is just under two third while the latter accounts for about one third (Masters and White, 2008). These index is based on prices of the nearest-to-expiration futures contracts

8 . The roll return is derived from the periodic sale of futures contracts nearing expiration and the simultaneous purchase of futures contracts bearing more distant expiration dates (the roll).

The effects of financialisation continue to filter through price dynamics in 2009-10. After fleeing from commodity markets in the second half of 2008, financial investors returned to

Fig. 4 Estimated Index Trader Positions and Commodity Prices, January 2006-May 2009



Source: UNCTAD secretariat calculations, based on Bloomberg; Goldman Sachs; and CFTC.

Note: The positions of commodity index traders are estimated based on the January 2006 weights of both the S&P GSCI and DJ-UBSCI, and index trader positions reported in the CFTC's Commodity Index Trader Supplement.

Source UNCTAD Trade and Development Report, 2009, Chart 2.2.

commodity markets in 2009, driven by their renewed growing appetite for risk under prevailing environments of low interest rates in developed countries. UNCTAD (2010b) reports a number of emerging evidences: i) the volume of derivatives trading in non-precious metals increased by 132.8 per cent in 2009 ; ii) commodity derivatives trading is growing particularly fast in China, where the Shanghai Futures Exchange, trading mostly in futures in industrial metals, tripled its volume in 2009; and iii) commodity assets managed by Barclays Capital rose to an all-time high year-end value of \$257 billion in 2009 representing the largest annual increase on record – with inflows of \$68 billion – contributing to a 42-fold increase in commodity assets under its management over the past decade. Should market sentiment shift again in asset markets in general reflecting the continued fragility of the world economy to date, another sudden reversal in commodity prices could aggravate high volatility intrinsic to commodity prices originating from shocks to commodity fundamentals either on demand or supply side.

Thus, trading activities in world commodity markets have undergone some fundamental changes in both the form and the scale of links between activities in commodity and financial markets. More complex commodity linked financial instruments and products such as commodity index swaps, exchange traded funds (ETFs) or exchange traded notes

(ETNs) are all the time launched in response to heterogeneous demand by portfolio investors. These portfolio investors may act as *noise* traders in derivatives markets, as they have little interest in physical commodity trading. The increased presence of noise traders is known to make prices excessively more volatile than warranted by fundamentals in all asset markets, as discussed in Section 3 below. With it, the nature of commodity price dynamics might have been altered significantly over short-run, if not in the medium term. At least over the short-term, prices can be less reflective of actual supply and demand dynamics of physical commodities. Indeed, it can be suggested that commodity prices would change in response not only to fundamental supply-demand relationships of physical commodities but also to portfolio investors' desire to hold commodities in both physical and *virtual* forms as asset class with the use of complex derivatives products and financial instruments.

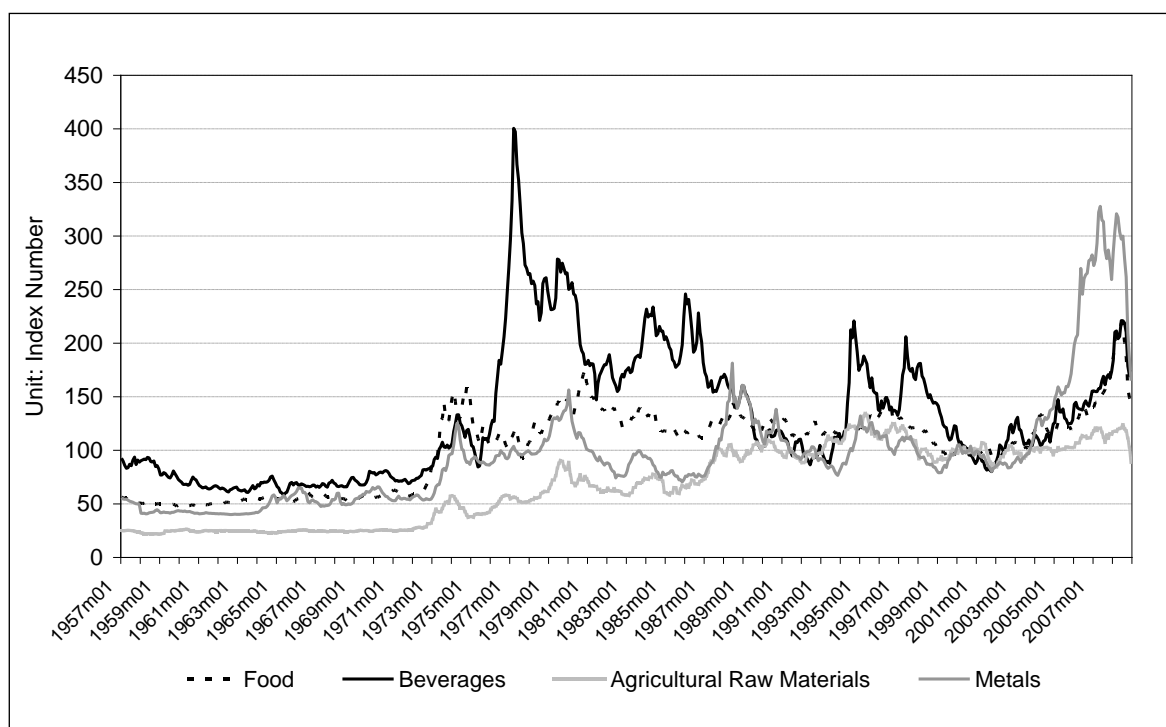
In Sections 5 below, we shall return to examination of the “financialisation” hypothesis – i.e. the proposition that links excessive volatility in commodity prices to marked changes in the scale and operations of derivatives markets. In the next section, we shall first discuss the implications that unresolved commodity- related issues for economic development of CDDCs - the commodity dependence trap.

4. International environments for generating the Commodity Dependence Trap

The High Price Volatility in a historical context

Fig. 7 places the recent commodity price cycle in a longer historical perspective, showing that the very high volatility has been characteristic features of primary commodity prices throughout the period of 1957-2008, while Fig 2 above demonstrates the high fluctuations in real commodity prices over a much longer period of nearly 100 years. Comparing the post Bretton Woods era (1973-2008) with the Bretton Woods era, Redrado et al. (2008) also note that the average volatility in real food price doubled, while that in real metal price has risen by 40 % between the two periods.

Fig.7. Non-Fuel Commodity price indices for different groups: 1957-2008



Source: compiled from IMF International Financial Statistics

Further, the upper chart of Fig.8 shows, the nominal sharp price increases in recent years have produced a mild upward trend in nominal non-fuel commodity price index since 1970, but the slope of that trend is flatter than those observed in petroleum price index or prices of manufactured goods. Further, the lower chart of Fig.8 confirms the continuing high volatility of commodity prices compared with prices of manufactured goods. Table 3 further shows the instability of prices of main commodity groups by sub-periods for the period of 1968-2007. While all commodity groups exhibit historically very high volatility, the annual instability index for most commodity groups except tropical beverages has

increased significantly over the recent decade. The extraordinary swing of commodity prices between peak-to-trough in 2008-9, illustrated by the numbers in Table 2 and Fig.4 above, are perhaps the clearest evidence on how the volatility has heightened over the past decade

At the same time, despite the sharp price increase in the recent boom period, real prices

Table 3. Instability of prices of main commodity groups: 1968-2007

	Instability Index (%)			
	1968-1977	1978-1987	1988-1997	1998-2007
Food	24.2	14.8	6.7	9.7
Vegetable oilseeds and oils	20.2	16.6	10.1	19.0
Tropical beverages	23.5	12.1	22.0	18.8
Agricultural raw materials	14.1	9.1	6.7	8.8
Minerals, ores, and metals	13.3	10.8	10.5	20.8
Crude Petroleum	26.9	29.4	11.7	15.6
ALL COMMODITIES	16.8	10.4	6.8	13.3

Instability Index (%) calculated as average percentage deviation from exponential trend. (2000=100)

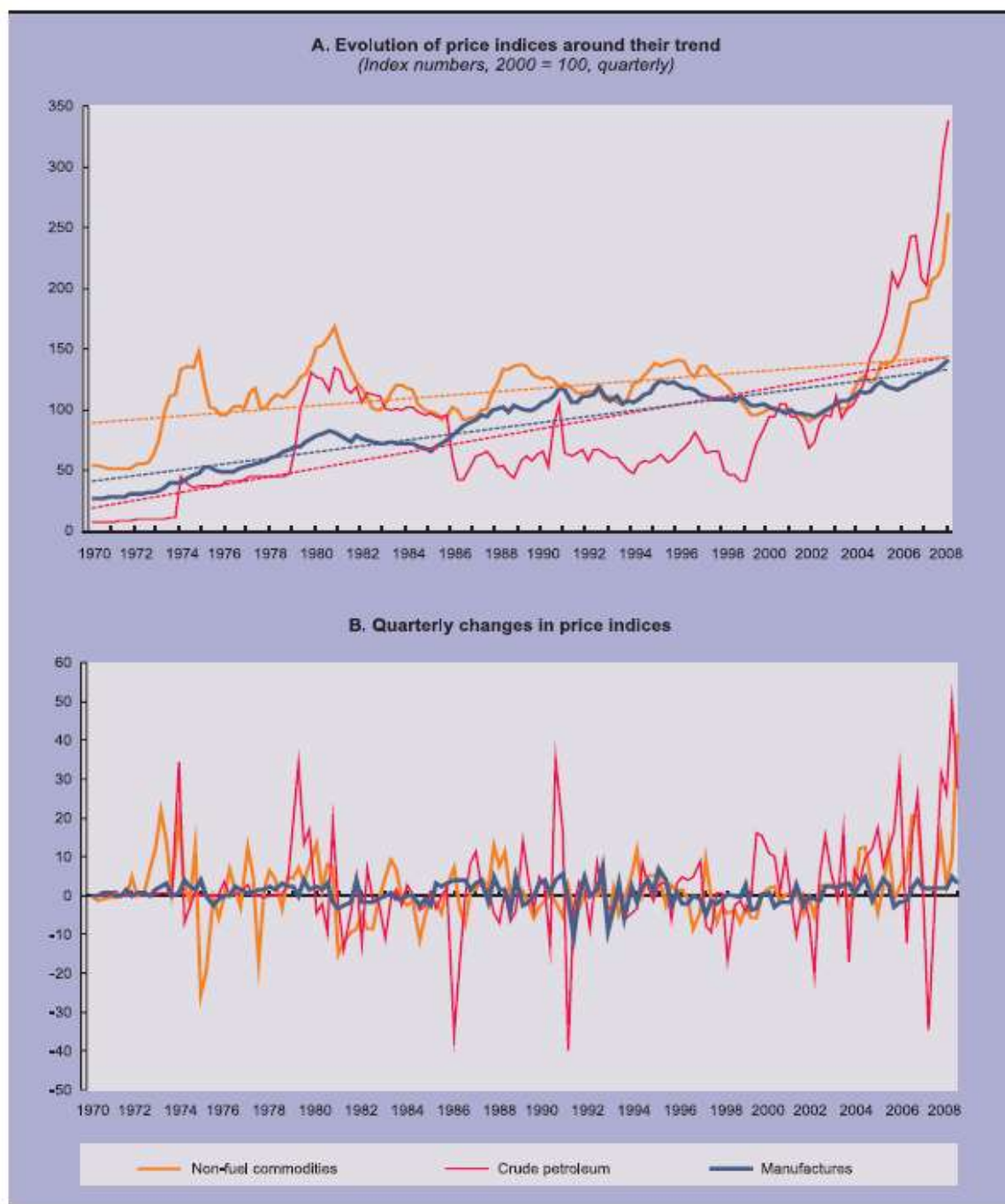
Source: Compiled from UNCTAD Statistical Handbook, 2008

indices of non-fuel commodities still followed a downward trend for a longer historical perspective for the period of 1960-2007. Commodity prices, except petroleum oil prices, did not register a record high level in real terms in the recent commodity boom of 2002-8 (Sapsford et al., 2010) and it is not clear yet whether they are going to reverse the historical downward trend altogether in foreseeable future (see Fig. 9 below). Redrado et al. (2009) make a similar observation on real prices of non-fuel commodities after accounting for the world inflation, at the height of the price peak in spring and summer of 2008: real food prices in 2008 are far below their level in 1960, a drop by 41.84%, while real metals prices have just recovered the levels exhibited in 1960.

Commodity-Dependent Economies in a Comparative Perspective

Today, several decades after gaining political independence, the persistence of high primary commodity dependence remains one of the most conspicuous characteristics of the trade linkage of countries in many low-income developing countries with the rest of the world under globalisation. According to UNCTAD (2007, 2008a), in Africa, 34 countries are dependent on three or less primary commodities, and 23 countries are dependent on a single commodity for more than 50 % of total export earnings. Most of African countries, classified as LDCs and HIPC, have higher dependency ratio of 80 % for their export earnings. Thus, the high commodity export dependence has a very specific regional dimension - a particular feature of many Least Developed Countries in sub-Saharan Africa. Fig.10 shows that among developing countries, Africa, Latin America and Caribbean (LAC), and Middle East and North Africa (MENA) have much higher dependence ratios, compared to South Asia, East Asia and Europe and Central Asia.

Fig. 8. Price Trends and Volatility of Non-Fuel Commodities and Crude Petroleum vis-à-vis manufactures



Source: UNCTAD secretariat calculations, based on UNCTAD, *Commodity Price Statistics* online; and UNSD, *Monthly Bulletin of Statistics*, various issues.

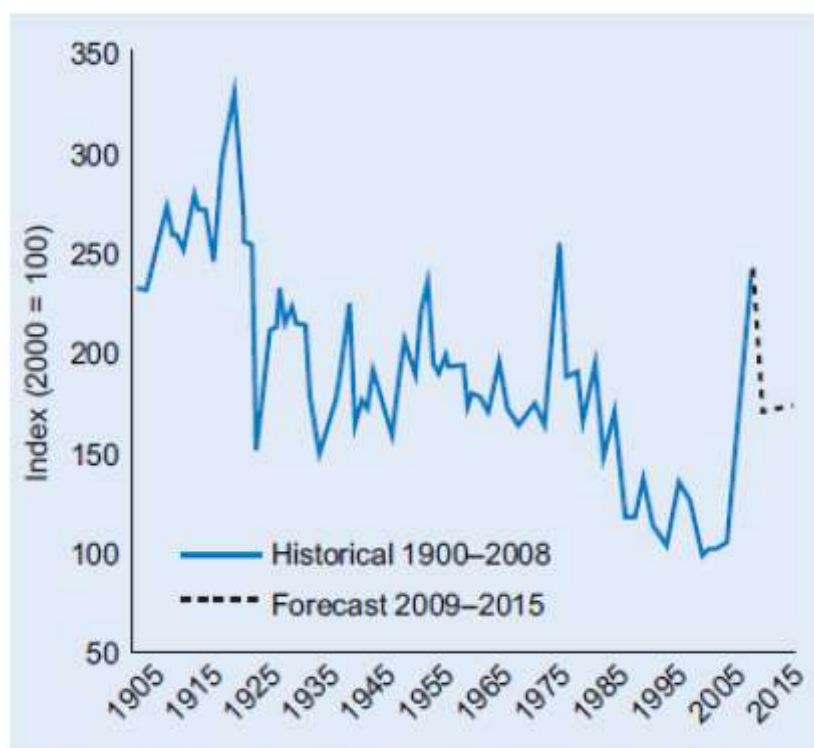
Note: The dotted lines represent the trend of the relevant price indices.

Source Chart 2.4, UNCTAD (2008b)

From a comparative perspective, the position and development experiences of highly

commodity-dependent economies in the globalising world economy since the early 1980s are in a sharp contrast to those of newly industrialising developing economies in the South. Commodity-dependent, resource-rich economies in Sub-Saharan Africa and smaller countries in the ECLAC region have been systematically underperforming in economic growth and poverty reduction compared to those of newly industrialising developing economies in the South, mostly in Asia, under globalisation (Nissanke and Thorbecke

Fig. 9. Real Non-Fuel Commodity Prices: 1900-2015



Sources: Grilli and Yang (1988); Pfaffenzeller et al. (2007).
World Bank estimates 2004–08, forecasts 2009–15.
* Indexes, 2000 = 100. Deflated by unit value of manufactured exports.

Source: Brahmhatt and Canuto (2010)

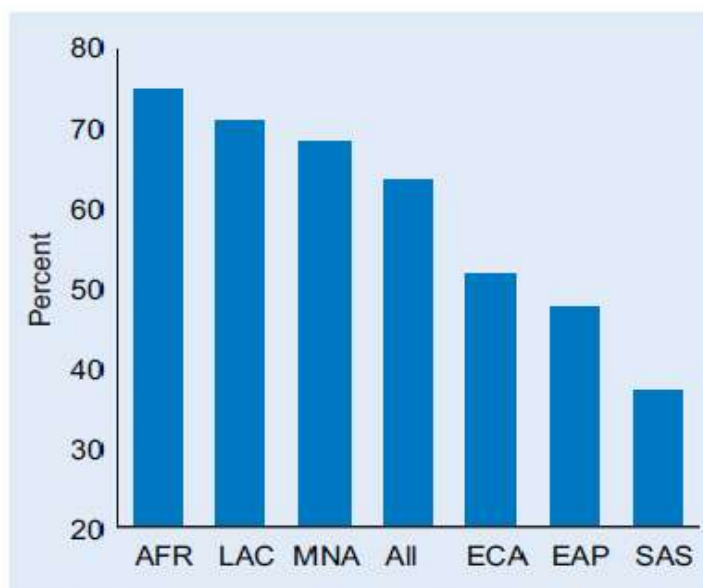
2010). In discussing the economic performances of countries in the ECLAC region, Ocampo and Parra (2006) attributes the cycles of growth spurts and collapses of many developing economies depended on primary commodity exports since 1950s to their susceptibility to external shocks originating from the global economy, and accordingly identify a ‘global development cycle’ that circumscribes the growth possibilities of these economies on a sustainable basis.

In contrast, many industrialising economies in Asia have managed to integrate into the global economy through diversifying their exports into manufactured goods with potential of exploiting economies of scale, and experienced a dynamic growth process through gradually climbing technology-and skill- ladders in their integration process. It is these dynamic emerging economies that account largely for a rapidly increased share of

developing countries in global GDP and world trade in goods and services.⁹ What countries export does really matter to the development process with globalisation (Hausmann et al., 2005).

Yet, as noted in CFC (2006), it is also true that some middle-income, resource-rich countries such as Brazil, Argentina, Malaysia and Thailand have recently benefited from increased demand for their agricultural and resource-based products and that they could be seen as newly emerging ‘commodity developers’, while managing at the same time to become less commodity dependent. Vietnam, though still a low income country, has fast approaching the status of ‘commodity-developer’ through its rapid growth of rice and coffee, while also diversifying into manufacturing and other industrial activities (CFC 2006). Hence, the persistent ‘commodity dependence’ is clearly a severe impediment to economic development for low income countries in sub-Saharan Africa or small countries in the Central America, classified as Least Developed countries than for natural-resource based middle-income countries in Latin America or newly emerging economies in Asia.

Fig.10. Share of Primary Commodities in Merchandise Exports of Developing Countries by Regions



Source: World Development Indicators, World Bank.
 *As % of merchandise exports. Simple averages for country groups.

Source: Brahmabhatt and Canuto (2010)

The former group of countries is often classified as CDDCs in the literature.¹⁰ Certainly, many mineral and oil rich countries in Sub-Saharan Africa benefited from the recent commodity boom of 2002-8. However, it is uncertain whether future economic

⁹ UNCTAD (2007) reports that in 2005, developing countries' share of global GDP at purchasing power parity surpassed that of developed countries for the first time, climbing rapidly from 44 % to 53 % just over the decade from 1995 to 2007.

¹⁰ . See Footnote 1 above for various categories of country classifications and a definition of CDDCs given in CFC (2006).

development of these countries can be assured on a long term sustainable basis with extremely high volatility of export prices of these commodities. Most CDDCs have failed to diversify their production and trade structures into higher value commodities or manufacturing (CFC, 2006). Furthermore, many countries dependent on agricultural commodities in SSA have lost their market share in world markets since 1980.

International Environments that has Intensified the Commodity Dependence Trap

In the recent mainstream literature, the under-performance of commodity-dependent and natural resource rich economies is increasingly discussed in relation to the two distinct *domestic* conditions which are identified as characterizing these economies: i) the natural resource curse - a domestic political economy structures which encourage rent-seeking, corruption from resource rents or outright resource looting¹¹; or ii) the difficulties with macroeconomic management over commodity price cycles, in particular, due to the Dutch Disease Syndrome during the commodity boom.¹²

In contrast, in the *International Poverty Trap* thesis advanced by UNCTAD (2002), the cause for the underperformance of commodity export dependent low-income countries, in particular those classified as LDC or CDDC, is attributed more to the failure of the prevailing international economic system to resolve the outstanding commodity-related problems. The thesis argues that under the prevailing international system, many CDDCs could be locked into an *international poverty trap* through integration into the global economy. In the thesis, international environments and domestic conditions are not independent from each other, but rather feed into each other to reinforce mechanisms of underdevelopment. Similarly, Ocampo and Parra (2006) suggest that the course of macroeconomic adjustments necessitated from, and the institutional effects of, the massive shocks coming from global commodity markets tend to exacerbate considerably the distributional conflicts inherent to the economies with high commodity dependence.

Indeed, clear evidence of the presence of the international poverty trap for many commodity dependent LDCs can be found in their early devastating experience in the 1980s, when real commodity prices collapsed, amidst the sharp recession of the world economy following contractionary macroeconomic adjustments to major industrial economies (see Fig.2 and 9 above). The price collapse at the time followed after the commodity boom triggered by the oil price shock of 1973-4 and the subsequent period of very high price volatility.

Drawing a parallel between the depth of the crisis faced by a large number of commodity dependent low-income countries in the 1980s and that in the Great Depression of the 1930s, Maizels (1992) demonstrated the severity of the 'commodity' crisis then and convincingly exposed how the beginning of the debt crisis of commodity-dependent poor countries in the early 1980s happened to coincide exactly with that of the 'conveniently forgotten' commodity crisis. The collapse of commodity prices in the 1980s amounted to a loss of real purchasing power of 40-60 % for many commodity export dependent countries

11 See for example Collier (2007), Auty (2001), Sachs and Warner (1997)

12 For the classical literature on the main mechanisms of engendering a Dutch Disease syndrome, see Corden and Neary (1982), Corden (1984), Neary and van Wijnbergen (1986) and Edward (1989).

- a deeper crisis than that faced during the Great Depression in the 1930s. Unfortunately, his in-depth and comprehensive analysis of commodity issues and his call for formulating correct international policy responses to the debt crisis, which would have led to an early resolution of the protracted debt overhang condition in low-income countries has been largely ignored by the International Financial Institutions (IFIs).

The persistent reluctance on the part of the IFIs and major donor countries belonging to the Paris Club in the 1980s and 1990s to acknowledge commodity-related developmental issues as one of the main causes for their debt crisis, and the resultant failure to deal with them effectively in a timely fashion has been extremely costly in terms of forgone development opportunities of CDDCs. ¹³ This is particularly severe in Sub-Saharan Africa, most of which were later classified as Heavily Indebted Poor Countries (HIPC). All debt relief mechanisms employed since the outbreak of the debt crisis, including the HIPC initiatives established in the late 1990s, failed to pay sufficient attention to the problem arising out of the commodity export dependence with the losses of their purchasing power in international economic transactions, and with it, the capacity to service external debt. The resolution of the protracted debt crisis had to wait for a comprehensive debt cancellation embedded in the Multilateral Debt Relief Initiative (MDRI) in 2005 (Nissanke 2010 a and c).

The debt crisis management by the international donor community in this manner has resulted in further aggravating the *commodity-dependence trap* inherited historically from the colonial era. Economic policies recommended by the IFI, in the semblance of both Washington and Post-Washington consensuses, have not been particularly effective in facilitating the process of structural transformation and diversification of their economies through rigorous productive and social investment. At the macroeconomic stabilization front, the demand management of commodity-dependent economies governed by external shocks should be *counter-cyclical* to *commodity price movements*. Yet, at the time of an externally induced balance-of payment crisis accompanied by a sharp drop in domestic demand, these countries have been forced, in the absence of alternative financial facilities, to adopt the IMF sponsored *pro-cyclical* stabilization programme that aims at a further contraction in aggregate domestic demand.¹⁴

The low-equilibrium trap of high debt and low growth was particularly evident in Sub-Saharan Africa among CDDCs throughout the 1980s and 1990s.¹⁵ With the advent of the debt crisis in the 1980s, a repeated dose of large scale fiscal retrenchment, which was a part of

13 . This is despite of notable efforts by UNCTAD and other UN agencies to draw attention to the commodity related development problems, as evident in UNCTAD (2002 and 2003).

14 See Nissanke (1993 and 2010 b) for a critical review of macroeconomic adjustment policies over the commodity price cycles in mineral-based developing countries.

15 This is in noticeable contrast to the earlier resolution of the debt crisis of middle-income countries through market-based mechanisms initiated by the Brady plan. Though many of emerging economies have subsequently exposed to repeated financial crises mostly due to full-blown capital account liberalisation, some of large resource rich middle income countries have become a “commodity developer”, in particular benefiting from increasing demand from Asian emerging economies such as China and India, as noted in the text above.

policy conditionality with Structural Adjustment Loans in the first decade of their debt crisis, reduced spending on public goods provision. Governments were generally left with little capacity and dwindling resources to implement development-oriented policies domestically and, in particular, to undertake public investment on a sustained basis. Typically, it is large-scale infrastructure projects that get first axed in fiscal expenditure allocations at times of crises. In reality, the fiscal retrenchment at the height of the debt crisis in the 1980s was so deep that essential public goods provision in social infrastructure such as basic education and health expenditure were also axed and it was assumed that these services could be provided on a fee-paying basis. This has often resulted in a fragile state with a seriously depleted and impaired institutional capability to deliver social services and to build physical and social infrastructure. Under these conditions, the scope and quality of public social services and infrastructure provision was progressively deteriorated in those years. ¹⁶

Particularly, the dwindling capacity to undertake public investment on the part of governments burdened with high debt resulted in their inability to promote and crowd-in private investment. The low level of both public and private investment combined had severe negative consequence for economic growth and development. In the absence of reliable public goods provisions, economic transactions in many CDDCs remain to be conducted in highly uncertain and risky environments, which engender eminently volatile returns on investment and income streams. The high degree of uncertainty and instability is also known to have a powerful deterrent effect not only on the rate of private investment and economic growth but also on the *composition* of investment in favour of reversible and safe investments that have a self-insurance character. Thus, under such circumstances, safe and liquid assets are systematically chosen over less liquid but high-yielding assets. While wealthy segments of population could chose to invest abroad, resulting in substantial capital flights, other private investors chose to put their capital in short-term assets in sectors with relatively lower sunk costs and shorter turnover periods, such as trading, rather than in long-term productive investment projects.

These conditions persisted through the 1990s in most CDDCs in SSA. In fact, such political and economic environments tend to keep economic activities of a significant proportion of private agents away from the "official" economy. Then, the so-called *informal* economy becomes an important source of employment and income for many households. In the absence of functioning formal institutions, economic activities tend to be restricted to small-scale production and local trade to obviate the contract enforcement problem through repeated dealing as well as cultural and social homogeneity assured within a confined geographical proximity. The majority of the poor, particularly the rural poor have been left behind. At the same time, a largely informal economy with a weak and narrow tax base reinforced the fiscal fragility.

Thus, the poor public goods provision and the fragile fiscal condition developed its own loop of a vicious circle for condemning these economies to a low development trap. With the debt crisis more or less stalling the development progress over the full two decades of

¹⁶ In parallel, the donor community had steadily reduced aid to economic infrastructure projects in relative to overall aid as well as to social infrastructures in SSA in the 1980s and 1990s. For main reasons behind this trend that has resulted in a significant infrastructure deficit in the region see Nissanke (2010 c&d)

1980s and 1990s in this manner, a mechanism of the commodity dependence trap has been at work, acting as a serious impediment to structural transformation of their economies into diversified economies so far. The revival of economic growth of these economies in the 2000s has been largely associated with the commodity boom of 2002-8, which has been driven by the sharp increase in demand for many primary commodities, both mineral and agricultural, from emerging economies, such as China and India as discussed above.

Importantly, these emerging economies have become very active in investing not only in oil and minerals, which has been the case with FDI from western countries, but also in agriculture and infrastructure (both soft and hard) in these CDDCs. For example, China, along with many other emerging economies such as Brazil, India and Malaysia, has increased aid and investment in Africa, offering a new kind of development partnership, without *policy* conditionality attached, on the basis of a “coalition” engagement, i.e. a collaborative state-business approach through aid-trade-investment as a package.¹⁷ So far, one of the main focuses of China’s aid through concessional loans has been exactly on economic infrastructure building, which is now universally seen as critical for Africa’s future. China has been providing concessional loans to a large number of countries in SSA under the “resources for infrastructure” format, known as the “Angola mode” in the literature.¹⁸

Potential dividends from these investment flows can be huge, as CDDCs have been historically deprived of investment flows in agriculture, manufacturing and infrastructure, all of which have long constituted critical bottlenecks for their economic development. In fact, the recent surge in interest in resource rich economies in SSA from China, India and other emerging creditors has already tangible spillovers, unforeseen hitherto in many countries in SSA. For the first time, private investors have increasingly started taking CDDCs in SSA seriously as one of the key destinations for their direct and portfolio investment. Accordingly, there is growing optimism that the low equilibrium stemming from the commodity dependence trap observed during the two-decade long debt crisis in the 1980s and 1990s may be finally overcome in the coming decades.

Whether this optimism can be turned into reality would depend critically on productivity of investment made with new capital as well as on economy-wide rates of social returns on investment to facilitate the process of transformation of economic structures into more diversified and broad-based ones. However, the sustainability of foreign investors’ interests in these economies cannot be guaranteed as the recent upsurge of investment is definitely related to investors’ anticipation of continued strong demand for primary commodities from emerging economies over the medium term. Yet, prices of all assets, including commodity prices, are notoriously unstable, continuously experiencing boom-bust cycles as

17 . See Nissanke and Soderberg (2010) for more detailed discussions of China’s drive in Africa including such questions as: China’s domestic imperatives for its drive in Africa; its adoption of the economic cooperation model practiced by Japanese government in Asia as China’s chosen aid modality with some notable variations; and its impacts on African development, which have raised both hopes and fears in the region.

18 This format was used in the contract concluded between China and Angola, through which China gave a US\$2 billion line of credit for the reconstruction of Angola’s basic infrastructure destroyed by the decades of civil war.

discussed above. Hence, CDDCs would remain particularly vulnerable, exposed to excessive price volatility upon sudden reversal of investors' expectation as observed during the recent global financial crisis and the subsequent deep worldwide recession of 2007-9.

*The emerging landscape of governing world commodity trade as reinforcing the commodity dependence trap*¹⁹

In addition to the intensified interaction between commodity markets and financial markets discussed in Section 3 above, the process of market consolidation has been intensifying along commodity supply chains over the recent decades at the global level. Today, Transnational Corporations (TNCs) can dictate significantly the patterns of international trade through intra-firm trade under their globally integrated production and marketing strategy. TNCs' activities are strategically organised and integrated either horizontally or vertically. This is reflected in their dominance in commodity value chains.

In agricultural commodity production and marketing, there are considerable asymmetries in market power and access to information, technology and marketing know-how between TNCs, on the one hand, and local entrepreneurs, farmers and traders in developing countries, on the other. Ironically, for small-scale producers and their governments, commodity markets have become fragmented, as TNCs' have hastened the integration process of their operation globally. This parallel process of fragmentation and integration has often resulted in a hugely skewed distribution of gains from commodity trade. Under the prevailing market structures, the potential benefits of productivity improvements can be largely appropriated by the TNCs and global supermarket chains, instead of going to fragmented producers and farmers. The governance structures of primary commodity value chains have become increasingly buyer-driven with a shift in the distribution of value skewed in favour of consuming countries. In mineral commodities, many mineral concerns in the regions were privatized in the 1990s under auspices of World Bank and International Monetary Fund (e.g. copper mines in Zambia). Depending on how privatization was negotiated and implemented, a large part of mineral rents from the recent commodity boom may not be guaranteed to be used for economic development of producer countries.

At the national level, there have been significant changes in institutional environments facing producers and farmers engaged in agricultural primary commodity sectors. For example, the waves of domestic market and trade liberalisation/deregulation transformed arrangements in production and marketing of agricultural commodities, including cash crops such as cotton and coffee. Most of state-run marketing boards were dismantled or downsized, and price stabilisation funds or mechanisms operated domestically ceased to exist. Domestic commodity traders and producers are now exposed to greater price risks as highly volatile prices are directly transmitted from the downstream commodity chain through the international marketing system to small traders and producers operating in upstream chain.

Further, with the withdrawal of institutional support from governments, stable and guaranteed access to provision of necessary inputs such as seeds or fertiliser and new

¹⁹ . See Nissanke (2010b) for more detailed discussion on this topic with reference to Tanzania, Uganda and Zambia.

technology are no longer available to farmers engaged in commodity production. The institutional vacuum thus created is supposed to be filled by private agents and traders. This has often resulted in geographical fragmentation of marketing activities, and placed small-holders in a weaker position in relation to private traders in both inputs provisions and marketing of their produce in upstream commodity chains. Producers have also become spatially fragmented and isolated both between and within villages. While producers have been increasingly exposed to vagaries of the international market (i.e. price volatility transmitted from international markets), they are not adequately equipped to deal with price risks and other marketing risks.

Given their increasing exposure to extreme price volatilities, the use of hedging instruments such as futures and options has been encouraged by the IFIs as an effective price risk management mechanism to small actors in producing countries. However, as discussed in Section 5 below, international commodity markets do not operate efficiently to enable stakeholders with interests in physical commodities to hedge risks effectively. These market-based instruments are not appropriate, often imperfect in reducing and hedging price risks even for large operators, let alone for small producers. In particular, issues such as high transaction and financial costs, skewed access to information and high technical barriers would make it hard to popularize these risk hedging mechanisms among small actors as universally applicable instruments. Further, at the local level, since it is difficult to create an adequate regulatory oversight agency required for liquid, functioning markets in a short time scale, local farmers and traders are forced to use international intermediaries or branches and subsidiaries of TNCs for accessing these instruments and technical expertise required, which would push the cost of hedging even higher.

A recent CFC commissioned study reports the outcome of the Pilot Price Risk Management Scheme for Cocoa Farmers' cooperatives in Côte d'Ivoire, in which an application of put options and participatory options (POPs) was experimented for hedging cocoa price risk in the crop season 2007-2008.²⁰ In Côte d'Ivoire, as in other countries in SSA, the IFI-sponsored market liberalization measures included dismantling price stabilization schemes and price support programs in cocoa sector in the 1990s. This resulted in more direct transmission of increasingly unstable international prices to cocoa farmers. Under this high risk environment, four cooperatives and farmers' associations selected for the pilot study were recommended to use actively 'option' instruments that were supposed to provide them with a floor price against large fluctuation in international futures exchanges.²¹

In particular, at the beginning they were promised that the application of a POP 'option' – a combination of purchase of put option and sale of a call option at different strike prices – would allow them to reduce downside price risk to guarantee steady income and hence to make more efficient production plans with less uncertainty on crop revenue. However, since costs of the POP are contingent on market developments and due in the course of the

²⁰ .See Zant (2009) for details how the pilot scheme was designed and implemented.

²¹ . It should be noted that the four cooperatives selected for the pilot project were relatively large, rich, well organized and well managed. Further, the POP option was abandoned in the middle of the pilot scheme due to the refusal by the international trader (Cargill) to bear the credit risk of the participating cooperatives in the POP option.

hedge, unpredictable variable hedging costs was difficult to manage for cooperatives. Further, the international trader (Cargill) - an intermediary in this pilot scheme - was not willing to bear the credit risk of the participating cooperatives in a POP option. Hence, the POP option was abandoned in the middle of the pilot study, and the cooperatives were told to switch to a simple option instrument, which involved a payment of high upfront costs at the trigger price, estimated to be around 14 % of farm gate prices. In addition, the cooperatives had to pay brokerage fees per transaction. Thus, the total user cost of market-based hedging instruments was considerable for cooperatives. Furthermore, the running cost of the pilot scheme itself was also extremely high with many international consultants and intermediaries participating. Given this outcome, in its evaluation of the pilot scheme the CFC (CFC, 2010) concluded that given the complex nature of financial markets, it would likely be unproductive to try to turn cocoa producers into successful players in commodity derivatives. Instead, they should focus on mastering to practice a set of proven risk mitigation strategies, which need to be selected on the basis of their practical effectiveness, robustness, and ease of use.

Similarly, the landscape of governing the mining sector has been radically changing in a number of mineral-based CDDCs over the last few decades, where we tend to observe a considerably weakening economic position of the governments after the implementation of privatisation programmes of mineral concerns. Under the emerged ownership structure of mineral concerns dominated by TNCs, the policy space for autonomous fiscal and monetary management in bringing about short-run stabilisation as well as long-run economic development is substantially reduced in these countries.

Generally, macroeconomic demand management of these economies is very complex, since an externally-induced balance of payments crisis, by its own force, leads to a sharp drop in domestic demand. The orthodox stabilisation policies adopted primarily to restore external equilibrium in such circumstances can move the economy further away from internal equilibrium, at least in the short-run. In the light of domestic aggregate demand, these policies can well be *pro-cyclical* to the direction of both internal and external market forces rather than *counter-cyclical* as they should be.²² For commodity dependent economies, macroeconomic management is judged as counter-cyclical, when an appropriate policy configuration of fiscal, monetary, exchange rate and financial policies would allow softening of the effects of commodity price shocks on both the external and the internal balances *simultaneously*.

One of counter-cyclical measures widely discussed in the literature on the Dutch Disease Syndrome from the commodity boom is to facilitate absorption-smoothing over commodity price cycles, for example, by accumulating foreign assets in commodity stabilisation funds abroad. Many high- and middle- income countries such as Norway and Chile are known to have successfully abated the boom-induced Dutch Disease condition by moderating the transmission of commodity price shocks to the rest of the economy through establishing stabilisation funds. For example, Chile adopted formally Structural Fiscal Balance policy in 2001 with a view to develop a cyclically-neutral fiscal policy, where current expenditure is stabilized by linking it to the structural level of fiscal income.²³

22 . See Nissanke (2003) for more detailed discussion on macroeconomic management of mineral-based economies.

23 See Ffrench-Davis (2010) for the details of the Structural Fiscal Balance policy in Chile.

A counter-cyclical fiscal policy thus entails the accumulation of revenues from the resource sector during booms, and the use of these revenues in situations of falling prices. This policy not only stabilises revenues over the commodity price cycle, but also reduces the pressure on the exchange rate to appreciate during the boom. The stabilisation policy such as this can be implemented at ease where revenue from natural resources accrues to governments as in Norway or Chile. In the former, stabilisation funds are managed through state ownership of oil and gas resources, whereas in Chile the government retains a larger share in the copper mining company and negotiated reasonable returns from the private companies in royalty payments and taxation in the privatisation process. Indeed, Chile negotiated, through the privatisation process, to retain government's share of 40% of the assets of its previously state-owned copper mining company, Codelco, as well as to tax at a fair rate on the remaining share. Further, a new taxation regime for the mines approved in 2005 has largely contributed to the accumulation of fiscal surpluses both in absolute terms and as a percentage of GDP since the beginning of the recent copper boom in 2002-3.

In contrast, many low income developing countries obtained very unfavourable terms and low deals from the privatisation programme of their national resources, which were often negotiated under auspices of the IFIs. For example, the Zambia Consolidated Copper Mine (ZCCM) – a large state-owned mineral complex – went through a sweeping privatisation process in the 1990s. It has been split into a number of mining companies owned by TNCs, with the government retaining a small share with TNCs benefiting from very low royalties, export tax and tax on profits. Given this, the contribution of the mining sector to the fiscal budget has been very marginal. Further, foreign exchanges earned from copper exports have accrued directly to the currency market under the float-cum- monetary target regime that has been in operation, rather than to the Central Bank. This has not only resulted in a pro-cyclical movement in exchange rates (a large currency appreciation during the boom and a sharp depreciation in the bust), but also prevented the Zambian government from establishing stabilisation funds from export revenues. Thus, under the prevailing monetary and fiscal regimes, Zambia is left with little room to pursue counter-cyclical intervention.

Thus, counter-cyclical macroeconomic management through commodity stabilisation funds as practised in Chile and Norway at the national level is undoubtedly a critical tool of managing resource rents for economic development in natural resource rich economies over commodity price cycles. Yet, our discussion of comparing the Chilean macroeconomic management with the Zambian experience over the recent commodity price cycle suggests that the practicality and efficacy of implementing such macroeconomic policy depends crucially on how mineral rents are distributed between domestic stakeholders and TNC conglomerates, and how they are used and managed. It should also be noted that many low-income CDDCs find it hard to conduct successfully counter-cyclical macroeconomic policy, not just because of its implementation requiring high technical knowledge and capacity, but because the opportunity cost of holding savings abroad is perceived too high in the light of immediate pressing needs to accelerate economic development and to reduce debilitating poverty.

In this context, Borensztein, Jeanne and Sadri (2009) argue that macro-hedging with derivative instruments could be viewed as an effective substitute for counter-cyclical macroeconomic management through commodity stabilisation funds. Using a dynamic stochastic optimisation model to estimate welfare gains, they suggest that in addition to

income-smoothing over commodity price cycles, macro-hedging would produce a significant positive “external balance sheet effects” through changes in an economy’s external assets and liabilities. In their analysis it is argued that macro hedging would not only reduce the need to hold foreign assets as precautionary savings against risk in export income, but also allows to issue more default-free external debt by reducing the downside risk. This is because macro hedging is seen to allow a country to increase the welfare gains by consuming a fraction of precautionary assets or by issuing debt. That is, in their simulation model, the use of hedging instruments allows a commodity-dependent country to reduce its net foreign assets, and to issue more default-free debt against future export income. They also suggest that hedging is likely to increase welfare also by reducing the uncertainty in investment in the commodity sector.

However, as discussed in Section 5 below in details, commodity derivatives markets do not operate efficiently for risk hedging purposes. Prices on futures markets do not often reflect the fundamental demand-supply conditions, and hence, act as a predictor of future spot prices that ensures the basis (i.e. the difference between future and spot prices) would narrow as contracts reach maturity. The greater divergence between spot prices and futures prices makes it harder to use for hedging risk of stockholding, as losses in one market cannot be effectively offset by gains in another. Furthermore, the use of hedging instruments is costly, involving large resources to cover high transaction costs in accessing to up-to-date market information and keeping close contacts with the development of financial and other commodity markets. It demands keeping high levels of liquidity to be able to respond to sudden margin calls. The effective hedging periods also tend to be short. Furthermore, as noted by Borensztein et al. (2009), for many commodities, most of hedging is currently limited to maturities of less than three months as the risk premium becomes very large for longer maturities. Indeed, commodity derivatives markets are incomplete with operating only over short time horizon. Though Borensztein et al. (2009) argues that this shortcoming can be overcome partially by rolling forward short-maturity contracts, derivative markets remain imperfect and costly in providing commodity dependent economies with efficient means for insuring against high price volatility.

There is no doubt that an eventual transformation into more diversified economic structures is the real solution to the problems associated with the “commodity- dependence trap”. Thus, developmental problems of these countries could be overcome only through rigorous investments in production capacity and physical and social infrastructures, leading to transformation of their trade and production structures. In the transition period, however, countries are required to develop a strong capacity to manage the commodity sector, where the process of active learning-by-doing experiences and accumulation can be facilitated. Yet, the new landscape of commodity marketing and production under contemporary globalisation tends to discourage the process of learning and accumulation of critical importance for economic development in Low-income CDDCs. On the contrary, the institutional environments facing commodity producers both at the global and the domestic levels have considerably weakened the capacity and resiliency of small holders and mining industries in these countries. Meanwhile, excesses in commodity price volatility have been

intensifying over the last decade, making the process of structural transformation of these fragile economies all the more difficult.²⁴

²⁴ . See Sindzingre (2010) for discussion on the process by which high volatility in commodity prices can aggravate the domestic condition known as ‘poverty trap’.

5. Financialisation of Commodity Markets and its Impact on Price Dynamics

Intensified financialisation of commodity markets: Consequences of the rapid expansion of derivatives markets

As the pace of financialisation of commodity markets has significantly accelerated in the 2000s, commodities are more integrated into asset portfolio of financial fund managers and wealthy individuals. Therefore, it is not surprising that the very high volatility of commodity prices has been increasingly conjectured as being linked to the financialisation of commodity markets with the rapid growth in derivatives markets. Fears have been frequently expressed that speculative activities by financial investors in commodity futures markets and OTC dealings can exacerbate price volatilities.

This conjecture is closely related to the *excess co-movement hypothesis* advanced earlier by Pindyck and Rotemberg (1990), in which a question is raised as to whether or not the co-movement in commodity prices can be explained exclusively in terms of demand-supply relationships of physical commodities. In the debate ensued since then, no one questions the presence of co-movement itself, since key macroeconomic financial variables are long known to affect levels of physical stocks held across commodities as common macroeconomic shocks, and hence, price dynamics over short-run.

For example, changes in interest rates affect commodity prices over short-run, via the volume of *physical* commodity stocks held through two channels: An increase in interest rates would reduce demand for commodities, leading to inventory accumulation, whilst it also raises storage costs, resulting in a reduction in inventory levels. The net effects of these two opposing forces are thought to generate price dynamics. Further, changes in the level of inventories are seen to affect commodity prices, as the spread between futures and spot prices that should reflect the cost of storage to the contract expiry date is an increasing function of inventory levels (Kaldor, 1939). At the same time, inventory levels of physical commodities are regarded as the best synthetic indicator of supply and demand balance in the short-run for many commodities. Hence, an analysis of convenience yield (the flow of benefits yielded from holding stocks) is usually utilised to explain relationships between inventory levels, macroeconomic variables and commodity prices (Kaldor, 1939).

Thus, it has long been accepted that the co-movement in commodity prices does mirror common macroeconomic shocks to inventories. However, what is intensely debated in the excess co-movement hypothesis advanced by Pindyck and Rotemberg (1990) is a question over whether the co-movement is well in excess of anything that can be explained by common macroeconomic effects such as current or expected inflation, or changes in aggregate demand, interest rates, and exchange rates.

In this context, we suggest that with the financialisation of commodity markets, inventory adjustments to commodity stocks held are increasingly influenced by activities in derivatives markets and dealings, in particular, index trading. Since financial investors opt for holding commodities *virtually* through futures contracts as part of their portfolio, other asset prices are bound to affect commodity prices. By implication we postulate that an “open interest”, that is, *virtual* commodity stocks held as part of diversified asset portfolios,

may exert a significant effect on commodity prices. If so, commodity prices and their inventory adjustments can be increasingly exposed to swings in *market sentiment* in asset markets in general. Should be this the case, the *excess* in co-movement in commodity prices may be explained additionally by the “liquidity” effects, whereby traders operating across different asset markets are subject to swings in market sentiment, hence to common cyclical movements in market liquidity conditions.²⁵

Thus, commodity prices, as prices of any assets traded globally, can be largely influenced by market liquidity cycles in global finance. From this particular perspective, we can have a plausible narrative of the recent episode of commodity price cycle. First, a large influx of liquidity into the US and other major financial centres since the early 2000s resulting from the “Global Savings Glut” and the “Global Macroeconomic Imbalances” (Bernanke, 2005) created an “easy money” condition in financial markets for several years before the onset of the financial crisis of 2007-9. This had inevitably produced price bubbles across major asset markets. Since commodity futures contracts through instruments such as index funds are increasingly held as part of investors’ portfolio, liquidity poured into commodity markets and created price bubbles well beyond prices that can be seen to reflect demand-supply fundamentals.

However, once the crisis situation developed and the global financial system was engulfed by the crisis of confidence, fund managers and investors scrambled for highly liquid assets such as US treasury bills, resulting in disappearance of liquidity in other asset markets. The reverse flow from funds, including unwinding of long positions in commodity futures markets, took place in a panic situation, where investors could not make informed decisions based on fundamentals and clear distinction between solvent but illiquid investment/assets and insolvent ones any longer. Risks in holding any illiquid assets were suddenly seen too high. This is the condition prevailed in many asset markets in the last quarter of 2008.

It is needless to say that the conjecture advanced here is still in an exploratory stage, requiring a series of empirical tests for its verification. The hypothesis that price dynamics of physical commodities can be significantly influenced by the financialisation process of commodity derivatives markets and deals can be contentious. Hence it is not surprising to observe counterarguments to this thesis. For example, Krugman (2008) casts doubts on the claim that the futures price can have an independent impact on spot prices without an accompanying change in inventories and demand-supply in physical commodities. Such arguments suggest that all changes in futures prices should eventually reflect changes in expectations about commodity market fundamentals, rather than futures prices directly exerting substantial influences on commodity prices.

Yet, it can be argued that on commodity markets, where both demand- and supply-elasticities are extremely low in short-run, price stability cannot be maintained easily and instantaneously through inventory adjustments only as investors’ sentiments on derivatives markets shift. Therefore, even though financial investors do not take on physical

25 . In our view, this is the main reason why Basu and Gavin (2011) could not find consistently a negative correlation between daily equity and commodity returns throughout their estimation periods. Inferred from this empirical finding, they reject a popular assertion prevailing among investors that commodity futures could serve them for hedging against equity risk.

commodity delivery, changes in futures prices resulting from positions taken by financial investors responding to swings in market sentiments and liquidity cycles could affect spot prices, without observing significant adjustments in levels of stocks held. Besides, changes in market sentiments affecting derivatives markets and deals also lead to an increase in precautionary demand for commodity holding, thus affecting spot prices directly. More generally, since physical commodity stakeholders make decisions on production, consumption and inventory stock management with reference to futures prices, any significant development in futures markets such as a fast-expanding demand for futures contracts from financial investor could exert strong impacts on spot prices. Indeed, Masters and White (2008) confirm that futures prices are used as the benchmark for spot market transactions conducted by physical traders.

Market Structures and Commodity Price Dynamics

Our discussions so far suggest that the recent commodity price dynamics are more likely the outcome of the interface between the two conditions – market fundamentals and the financialisation. Indeed, it is hard to explain the spectacular rise and fall in commodity prices for 2007-08 in terms of shifts in market fundamentals *alone*. However, disentangling empirically the two conditions is not easy, as commodity prices are determined, similar to prices of other assets, on the basis of *expectation formation* on the part of heterogeneous market participations. A critical issue is, therefore, whether their expectations are always formed in relation to market fundamentals of physical commodity traded in question.

Those who believe that markets are efficient in absorbing and processing instantaneously the information regarding market fundamentals along the lines of the “efficient market hypothesis” as advanced by Fama (1965) assert that commodity prices are essentially determined by the demand-supply relationships governing physical commodities. For example, the special study on commodity markets by the World Bank (World Bank, 2009) or periodical analyses on commodity price development reported in the World Economic Outlook by IMF (e.g. IMF, 2009) interpret price dynamics basically in terms of demand- and supply- developments only, and do not consider the effects of financialisation on price dynamics. In contrast, UNCTAD (2008b and 2009) discuss why the effects of the financialisation on commodity price developments can be sizable and growing over the price cycles of 2002-2009.

Drawing on empirical analyses on microstructures of commodity markets such as Gilbert (2008a and b) and Mayer (2009), UNCTAD (2009), for example, challenges the efficient market hypothesis (EMH) as applied to commodity markets. On the contrary to propositions implied in the EMH, commodity prices are formed not necessarily on the basis of the information about demand and supply relationships of physical commodities (the information content effects) and that prices are often subject to the weight-of-market effects, as perfect competition does not prevail in reality and prices are influenced by large traders. These two effects can be discerned when changing compositions of heterogeneous traders in commodity markets are taken into account. That is, traders are heterogeneous in their motivations for participating in commodity derivative markets. They can be classified into three categories: *informed* traders; *noise* traders and *uninformed* traders.

Informed traders with interests in physical commodities use derivatives instruments mainly for risk-hedging purpose as stakeholders and they try to base their trading decisions on market fundamentals of a particular commodity. However, they are constrained by great uncertainty surrounding directions of future fundamentals as well as by the paucity of reliable data on inventories. Hence, they often tend to follow market sentiments and the herd.

Noise traders such as index traders make strategic decisions on commodity trade in relation to development of other asset markets as part of investors' portfolio allocation. As US Senate Committee Report (2009) describes, a commodity index is calculated according to the prices of selected commodity futures contracts that make up the index such as the S-P-GSCI or DJ-AIG Indices. Commodity index traders - usually swap dealers active in OTC dealings mostly based at big investment banks - sell these financial instruments to institutions such as hedge funds and pension funds as well as wealthy individuals.²⁶ The buyers of index funds want to invest in commodity markets without actually buying any commodities. To offset their financial exposure to changes in prices, index traders take continuously a long position in futures market, i.e. they buy the futures contracts on which the index-related instruments are based. Treating commodities in aggregate they push commodity prices up irrespective of demand-supply conditions of a particular physical commodity. Acting as commodity index traders their portfolio decisions make commodity prices closely correlated. Clearly, commodity specific fundamentals feature much less in their positions taken on futures trading.

Finally, *uninformed traders* are those who typically apply statistical techniques such as chartist analysis or momentum trading on price trends, instead of basing decisions on information about market fundamentals of physical commodities. Financial investors such as managers of money funds or other investment funds make profits on futures trading by employing these techniques and exploiting actively price volatilities on a high frequency basis. According to the techniques/rules used, they react to price movements. However, in doing so, they cannot distinguish between price changes induced by informed traders on the basis of shifts in market fundamentals and those triggered by moves of noise traders. They can reap more profits from volatile markets than tranquil markets as risk premium from speculation are higher in the former as discussed below.

As price movements mirror changing positions taken by these heterogeneous trading activities, prices are unlikely to reflect informed decisions based on market fundamentals only. Rather, price signals emanating from futures markets are likely to be contaminated with "noises" unrelated to demand-supply fundamentals. In the process, interests of stakeholders of physical commodities, who rely on derivatives markets for hedging and price discovery purposes, could not be safeguarded. The larger the share of noise and

26 . Masters and White (2008) report that 85 to 90 percent of all index positions are held by swaps dealers and that the swap dealers are in turn dominated by four investment banks: Goldman Sachs, Morgan Stanley, J.P Morgan and Barclays Bank, who together accounted for over 70 percent of swap dealings in 2007-08.

informed trading in relation to informed trading by physical stakeholders, the further are prices likely to move away from the reality of demand-supply fundamentals.²⁷

Therefore, commodity futures markets are less likely to operate by processing instantaneously and accurately the information related only to market fundamentals. Moreover, the “weight-of-market effects” can generate high price volatility, as a result of positions taken by larger financial investors rather than changes in fundamentals. This is because such orders can dominate markets, if markets cannot absorb them without unduly affecting prices in the absence of matching high counter-party liquidity in place. Index traders tend to exert such weight-of-market effects on commodity futures markets. US Senate Committee Report (2009) also finds ‘there is significant and persuasive evidence to conclude that commodity index traders, in the aggregate, were one of the major causes of “unwanted changes” in the price of wheat futures contracts relative to the price of wheat in the cash market: p.2’.

UNCTAD (2009) thus concludes in relation to commodity markets operations that: i) financial investors who do not trade based on the state of fundamentals have gained considerable weight; ii) the herd behaviour of many traders, who operate in an imperfect information environment on demand and supply developments, can reinforce price impulses emanating from financial investors; and iii) the short-term inelasticity of demand and supply prevents immediate adjustments of prices to levels determined by fundamentals. All in all, it supports the view that the mechanisms of efficient absorption of information and physical adjustment of markets have become weak in the short term at least, which heightens the risk of speculative bubble-bust cycles occurring.

Microstructures of Asset Markets and Speculative Price Bubbles

More generally, the behavioural finance literature has long recognised that whether or not asset markets function efficiently depends critically on their microstructures - i.e. whether markets are dominated by “rational” traders acting on market fundamentals or by “irrational” noise traders acting on “fads”²⁸. In particular, the behavioural finance approach acknowledges that traders/agents can be irrational, when they are not only constrained by the availability of information, but also by their ability to absorb, understand and process information. This induces agents to use simple rules (“heuristics”) to guide their behavior rather than trying to understand the overwhelming complexity of the real world.

27 . According to the CFTC data, index traders and other uninformed traders combined account for more than two third of the long open interest position in commodity futures markets.

28 . In recent literature on commodity market analysis discussed above, ‘noise’ traders are referred to as specifically those financial investors such as index traders who treat commodities in aggregate, while those ‘technical’ traders are categorized separately as ‘uninformed’ traders. In behavioural finance literature, however, ‘noise’ traders encompass all those who take positions based on ‘fads’ rather than on fundamentals, including traders that make use of statistical techniques.

One such trading rule is positive feedback trading or trend chasing, where past prices are extrapolated to the future. As De Grauwe and Grimald (2006) discuss, the popular use of Chartism/technical trading, momentum trading or the evidence of herding in financial markets, points to the prevalence of such a rule employed by “irrational” traders. Their trading behaviour, based on extrapolative expectations or positive feedback trading, tend to have destabilizing effects, driving the price of an asset away from its fundamental value.²⁹ However, under a tranquil market condition, “rational” traders could prevail and counteract destabilising forces generated by “irrational” traders and align asset prices back to their underlying value.

The excess volatility generated by noise traders is also analysed in the asset markets model, advanced by De Long *et al.* (1990a, 1990b), with focus on the interesting interface between arbitrageurs and noise traders. ‘Arbitrage does not eliminate the effects of noise because noise itself creates risk’ (De Long *et al.* 1990b: 705). That is, the unpredictability of noise traders’ beliefs and expectations, which can be erroneous and stochastic in the light of fundamentals, could create a ‘noise trader risk’—a risk in the asset prices, which deters rational arbitrageurs from aggressively betting against them. This is because arbitrageurs are likely to be risk-averse, acting with a short time-horizon. Hence, they tend to have limited willingness to take positions against risks created by noise traders. As a result, ‘prices can diverge significantly from fundamental values even in the absence of fundamental risk’ (De Long *et al.* 1990b: 705). Moreover, bearing a disproportionate amount of risk thus generated enables noise traders to earn a higher expected return than rational investors engaged in arbitrage against noise. Clearly, their model challenges the standard proposition made by Friedman (1953) that irrational noise traders are always counteracted by rational arbitrageurs who could drive asset prices close to fundamental values.

These models and empirical observations that examine asset market microstructures support the view that speculators, acting on ‘fads’ or guided by ‘extrapolative’ expectations at short-term horizon, can exert destabilizing effects on markets. Furthermore, not only do destabilizing speculators exist, but they can - contrary to Friedman’s reasoning - also be profitable and have a lasting impact on asset prices. Further, the interface among traders with different motivation is very complex, as informed traders have to respond to the unpredictable behaviour of noise traders rather than to expected changes in fundamentals. The interface is also non-linear, as the market composition among heterogeneous traders shifts as market conditions change. Markets are likely to be dominated by arbitrageur rather than noise traders under ‘tranquil’ market conditions with a low volatility of fundamentals. However, as the level of volatility of fundamentals and the size of risk premium increase, more noise traders tend to enter markets in search of profit opportunities thus created.

²⁹ Mirowski (2010) discusses the process by which the internal dynamic of market innovation became more complex over the last few decades and the system as a whole evolved to an ever-more fragile structure, until it reached the point that it could be globally vulnerable to the system breakdown. He notes an application of complex programming software termed as ‘high-tech chartism’ to derivatives markets made risk hedging impossible.

Equally, many traders could switch their positions from arbitrageurs to ‘destabilizing’ speculators as market conditions shift,³⁰ since volatile market conditions entice more investors and traders to take aggressive positions by positing high risk premiums. Then, an issue at stake is not merely whether speculators increase price volatility, but also whether they generate and exacerbate asset price misalignments in terms of fundamentals.

Indeed, a computer simulation analysis by De Grauwe and Grimaldi (2006), as applied to currency markets, shows asset price dynamics can be characterized by two different kinds of equilibria: a *fundamental* equilibrium, in which fundamentalists and chartists co-exist and the former keep asset price to its fundamental value, and a *bubble* equilibrium characterised by the predominance of destabilizing chartists. Once in a bubble equilibrium, the higher profitability of chartists continues to drive the asset price away from its fundamental value. Further, asset prices become not only disconnected from its fundamental value, but also experience excessive volatility, not warranted by market fundamentals.

Applying this microstructure analysis of assets markets to commodity markets, it is clear why the predominance of noise trading, combining activities by traditional speculators and index traders, over informed trading by physical stakeholders could make commodity markets more likely to develop a bubble equilibrium, in which excessive volatilities are generated both in short-term and in medium-term. Futures markets are then no longer capable of playing the important functions ascribed, i.e. that of price discovery and risk hedging.

Empirical Tests of the Financialisation Hypothesis

Clearly, there is a need to test empirically the competing hypotheses with a view to deepening our understanding how new conditions may have interacted with one another to produce increased price volatility across commodities. Over the last few years, several empirical papers have emerged to take up this challenge, in particular to address the concerns raised over the likely effects of financialisation on commodity prices.

By examining monthly data of 51 commodities over the period of 1980-2008, for example, Lescaroux (2009) attempts to test specifically the excess co-movement hypothesis discussed above. He suggests that the high level of correlation between price cycles of oil and metals is explained to a large extent by common macroeconomic shocks to inventory levels. He argues that once the influences of supply and demand through stock levels are filtered out, the links between prices of these commodities become. From an estimation of cross correlation among the short-run cyclical price series, he concludes that the tendency of commodity prices to oscillate together reflects mostly the tendency of their fundamental factors to move together and that the financialisation of commodity markets through participation of non-commercial actors and their herding behaviour does not lead to excessive co-movement.

³⁰ In this sense, rather than different types of traders, the juxtaposition of “noises” and “fundamentalists” could be interpreted in terms of trading rules. That is, market participants follow different trading rules, depending on market conditions (Kaltenbrunner and Nissanke 2009).

However, Lescaroux's analysis is incomplete in many aspects: it considers neither the effect of "virtual" stocks nor changes in market structures through the fast expansion of derivatives markets and dealings over more recent years. Hence his results do not offer strong evidence for refuting the *excess* co-movement hypothesis as formulated in Pindyck and Rotemberg (1990). Indeed, Tang and Xiang (2010) reach an exactly opposite conclusion to Lescaroux's by examining the difference in co-movements between indexed and off-index commodities in rolling return correlations of crude oil with these commodities in the 1990s and 2000s. Their results confirm the hypothesis that the financialisation of commodities, in particular, the large influx of commodity index investment is the main factor behind the rapid increase of commodity price co-movements and their high correlation with other financial asset prices in recent years. They also observe a significant structural break in commodity price dynamics in the 2000s, caused by an entry of index traders in commodity markets. Silvennoinen and Thorp (2010) also report the results that confirm an increasing correlation dynamics of returns on commodity futures with stock and bond returns in the period of 1990 and 2009.

Importantly, a new strand of literature has emerged for testing the financialiation hypothesis that goes beyond just looking into co-movements of prices across commodities and those with returns of different assets. For example, Gilbert (2010) examines the extent to which high commodity futures prices over 2006-2008 resulted from bubble behaviour based on extrapolative expectations of speculators and index-based investment. Applying statistical analyses to high-frequency data for crude oil, three non-ferrous metals and three agricultural commodities (wheat, corn and soybeans), he concludes that while evidence for the behaviour characteristic of extrapolative bubbles is modest, the impact of index-based investment may have been substantial and bubble-like.

Compared to a nuanced position taken by Gilbert, Irwin and Sanders (2010) and Sanders and Irwin (2010) take an assertive position against the financialisation hypothesis. They suggest that there is no strong evidence pointing to speculative bubbles in futures markets of agricultural commodities resulting from the financialisation, on the basis of their statistically insignificant relationships between changes in index and swap fund positions, on the one hand, and market volatility, on the other. From this, they infer that an increase in index fund activity in 2006-08 did *not* cause a bubble in commodity futures prices and suggest that increases in index trading are followed by lower market volatility with liquidity provisions for meeting hedging needs. They conclude that extensive changes in the regulation of index funds participation in agricultural commodity markets are not warranted. While non-convergence between spot and futures prices resulting from an influx of index funds is recognised as indicators of malfunctioning futures markets, they voice opinion against the call for more strict regulations over index trading activities in wheat futures markets reached by the US Senate Committee investigation. However, their policy conclusions have been challenged by many researchers since its publication.

Indeed, the opposite conclusion is reached from other empirical analyses. For example, Mayer (2009) examines commodity market structures and price dynamics by distinguishing two types of financial investors – money managers and index traders – in terms of both their trading motivations and their impact on commodity price developments. While index traders follow a passive strategy holding virtually only long positions, money managers trade on both sides of the market for maximizing short-term returns. His analysis indicates

that (i) index trader positions are particularly influenced by roll returns, while money managers emphasize spot returns, and that (ii) money managers moved from emphasizing diversification to a more speculative strategy by taking commodity positions that are positively, rather than negatively, related to developments in equity markets. His Granger-causality tests indicate that these differences translate into different price impacts: (i) index trader positions have a causal price impact particularly for agricultural commodities, and (ii) money managers had a causal impact during the sharp increases in the prices for non-agricultural commodities. Thus, Mayer concludes that the effects of the financialization of commodity futures trading have made the functioning of commodity exchanges increasingly contentious, and that it is necessary to make regulatory changes.

The financialisation process should be further investigated to understand how commodity price dynamics are generated in short run and long run. By applying a smooth transition autoregressive analysis to a heterogeneous agent model, Redrado et al. (2008) test empirically the hypothesis that financialisation generates a non-linear adjustment pattern of commodity prices to its fundamental value. Their results indicate the slow-adjustment of commodity prices to fundamentals after an exposure to exogenous shocks in futures markets. Hence, they suggest that the impact of financialisation of commodity markets and speculative activity therein are more likely to be reflected on short run price dynamics, rather than in the long term equilibrium level of prices.

All in all, the empirical studies reviewed above demonstrate how important it is to examine explicitly microstructures of commodity markets, especially possible differences in motivations and behavioural patterns of heterogeneous actors, and hence in their differentiated impacts on price dynamics, in particular on formation of speculative bubbles

6. Mitigating excessive commodity prices at the global level

Our discussions and analyses so far suggest that the recent heightened price instability common across commodities can be attributable, at least in part, though by no means exclusively, to a growing application of “destabilising” trading by financial investors to commodity futures exchanges and dealings. Specially, massive overshooting of commodity prices in the first half of 2008 and under-pricing in the second half of 2008 could not be easily explained without taking into account large-scale leveraging and deleveraging of financial investors in commodity derivatives markets.

While we require more analysis to understand how the financialisation process can give rise to *excess* volatility in relation to market fundamentals, evidences available so far suggest that unregulated derivatives markets and dealings overpopulated by financial investors with little interests in physical commodities have increased the likelihood of generating excessive volatility. Further, the scale of excess may have become so large that stakeholders in physical commodities could not rely any longer on price signals emanating from futures markets for making informed decisions concerning demand and supply conditions, including those affecting investment and technological progress required for substitution and conservation of resources. Under such a condition, futures markets would cease to perform its intended function - that of price discovery and risk hedging for physical stakeholders.

Hence, a fresh case can be made to tame *excessive* volatilities in commodity prices in the light of the large price swings that have severely strained the global economy and contributed to the global economic crisis of 2008-2009. The failure of the previous commodity stabilisation schemes through buffer stock management and export quota allocation embodied in the International Commodity Agreements of the 1980s cannot be used as a legitimate and easy excuse for no action. While excessive volatilities can provide traders and investors with attractive short-term gains, the long-term consequences from asset price bubble-bust are now widely acknowledged as devastating, entailing a heavy collateral damage to world trade and real economies as well as high social costs worldwide. The recent global crisis is a clear testimony to the presence of an enormous wedge between private and social returns from activities in asset markets. It has created not only winners and losers in a grossly unfair proportion, but a colossal negative-sum game for the global economy and community.

Reflecting the depth of the global crisis of 2007-09, wide-ranging reform measures governing financial markets have been under consideration. Commodity derivatives markets and dealings should be an integral part of such regulatory reforms. Moreover, it can be argued that regulation of commodity derivatives markets is of critical importance, as cost-push inflation led by high unstable prices of strategic commodities such as food and energy, pose not only an immediate challenge to the macroeconomic stability of the global economy but also a serious threat to the livelihood of the most vulnerable – the poor in developing countries. Excessive volatility and price movements which can be attributable to *destabilising* speculation on the part of financial investors with little interests in development of commodity market fundamentals, could have a wider political ramification by giving rise to unbearable hardships to the poor and hence social unrests in many

developing countries. A special case for regulating commodity derivative markets should be made with reference to the unique function of commodity derivatives markets for providing physical stakeholders with means for hedging risks as well as price discovery.

In this context, the US Commodity Futures Trading Commission (CFCT) has been undergoing a series of high-level hearings in order to reintroduce regulatory measures over a number of commodity derivative markets, including oil, natural gas, gold and silver as well as grain markets. Regulatory measures proposed include: i) a re-imposition of aggregate position limits on futures contracts to counteract the “weight-of money” effects³¹; ii) an enhancement of transparency of activities in futures markets and OTC deals; iii) capital deposit requirements or requirement of physical delivery on portion of each future transaction; iv) elimination of the loopholes in regulations that have allowed traders to benefits from different regulatory regimes governing commodity trading; and v) imposition of counter-cyclical margin requirements (US Senate Committee, 2009).

Alongside these regulatory measures, the significant market failure in commodity markets may also warrant an effective intervention through establishment of new stabilisation mechanisms. Clearly, as commodity market operations have become very sophisticated, any policy intervention has to be *innovative*. Relying exclusively on buffer stock management for stabilisation is both ineffective and costly in the face of rapidly shifting market fundamentals such as those observed in 2002-2008. Similarly, the earlier historical experiences show that stabilisation schemes through export quota allocation or other supply management among producing countries entail significant transaction costs to negotiating parties as well as other technical problems such as coordination failures and free-rider problems. Naturally, good inventory management is a necessary condition for avoiding extreme price volatility in the short-run for all commodities. Strategic reserve holdings should be always kept at a prudent level for many essential commodities. It is now well recognised that the very low level of stocks of some grains have contributed to the food crisis of 2008.

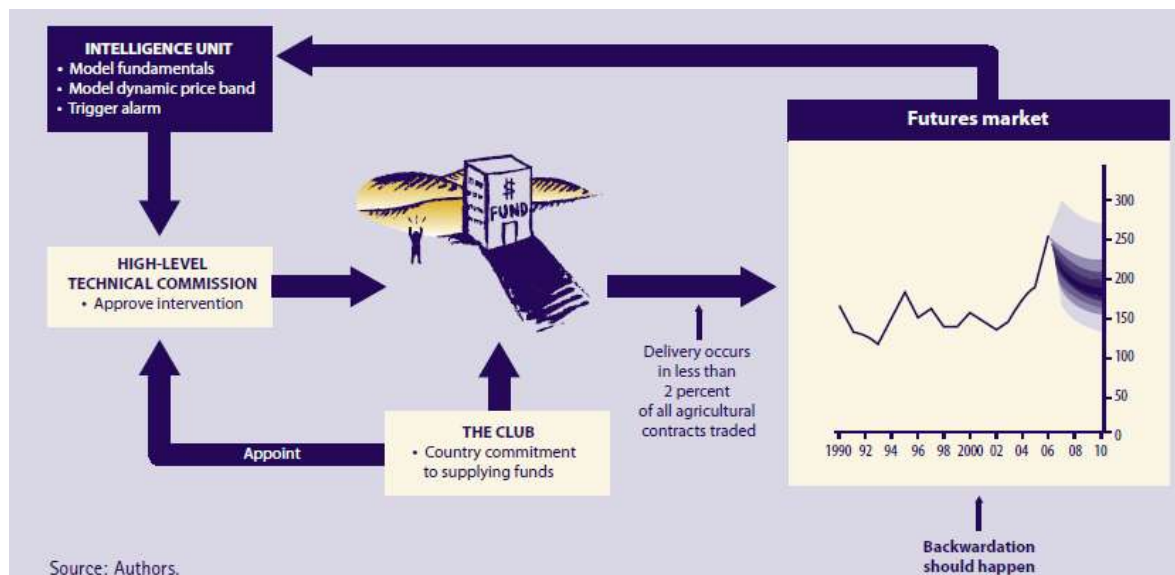
In addition to better, strategic inventory management, however, it is important to put an effective instrument to use for efficient intervention with “innovative” stabilisation mechanisms. Such an intervention should be “market friendly” and “smart”, so that intervention can be switched on and off at ease by differentiating between varying market conditions. On the one hand, intervention should not impede market development and deepening, as enhanced liquidity is critical for effective risk hedging. Hence, under normal, tranquil conditions markets should be left to function efficiently with little interference. On the other hand, as soon as the markets drift away towards bubble equilibrium, an intervention should be triggered to signal traders that their destabilising speculation would be counteracted. Yet, when market fundamentals evolve fast, it may be hard to aim at maintaining commodity prices in a particular reference zone pre-negotiated with conventional stabilisation instruments. When defending price levels are difficult with rapidly changing parameters affecting fundamentals, it may be more effective to aim intervention at dispelling fast “excess” in volatility from markets by inducing a swift change into trading behaviour away from destabilising “noise” trading. Hence, new

31 . Swap/index traders are currently treated as “commercial” traders, not as “non-commercial” traders in the CFTC classification, and thus free from position limits.

stabilisation schemes should contain an element of “virtual” intervention that can be activated fast with a view to tame markets quickly when speculative bubbles are about to develop.

In this context, it is interesting to evaluate the proposal put forward by von Braun and Torero (2009) of IFPRI. It advocates “two-pronged” global collective actions for food price stabilisation, consisting of: i) a small physical decentralized food reserves to facilitate a smooth response to food emergencies and humanitarian assistance; and ii) a *virtual* reserve facility, backed by funded promissory notes, which can be used for timely intervention in futures market to prevent price spikes and to keep prices close to long-run fundamentals. Under the first prong, food reserves, internationally committed in addition to strategic reserves by each nation, are maintained about 5 % level of the current food aid flow, managed by the World Food Programme (WFP) in different locations in the developing regions. They propose this would be financed by emerging funds provided by G8 + 5 countries (G 8 plus Brazil, China, India, Mexico, and South Africa). The second prong would be operated by member countries participating in the proposed scheme (the Club) and backed by a virtual reserve with promissory notes. It is envisaged to establish two institutions - the Intelligence Unit and the high level Technical Commission, as shown in Fig. 5. The former, as an international public agency, monitors closely price movement, and designs and maintains a dynamic price band system in the light of market fundamentals. It announces publicly and regularly price forecasts and the price band warranted by development of market fundamentals over time. In my view, this function by

Fig. 5. Institutional Design behind the Virtual Reserve under the IFPRI Proposal



Source: von Braun and Torero (2009), Fig.2

itself should allow traders to anchor their expectations more in market fundamentals, and hence help prevent noise traders from engaging aggressively in destabilizing speculation.

However, in the event of speculative bubbles developing and prices moving significantly outside the dynamic price band set in relation to evolving demand-supply fundamentals, an intervention in futures market is activated by an authorized order from the high-level Technical Commission on the basis of “trigger” provided by the Intelligence Unit. The intervention could take, for example, the form of executing a counterbalancing futures “short sells” position so that spot price rises are moderated. Since signalling a *credible* commitment alone to counteract speculative positions taken by traders would moderate price rises, reserve funds committed for making the scheme’s “short sells” in futures market remain *virtual*. As futures contracts can be closed through liquidation by offsetting positions soon after, actual “pledged” financial resources remain unused.

Thus, the IFPRI scheme can be viewed as a proposal to use a credible commitment on the part of the newly created public institution to act timely to realign prices back to market fundamentals and dispel “excess” volatility created by noise traders with the use of “virtual” reserves. The effectiveness of the scheme’s mechanisms depends on the high reputation and technical competence of the Intelligence Unit in its capacity to forecast prices and set a dynamic price band accordingly. It also depends on the willingness of the member countries to coordinate and pre-commit sufficient resources, so that “virtual” reserve has the credibility to perform the intended “public goods” function of price stabilization.

Innovative stabilization mechanisms can be also designed with policy instruments other than “reserve” holding. For example, an application of a multi-tier transaction tax system to commodity derivatives markets can be considered as an effective mechanism for commodity price stabilization, whilst it is originally discussed in the context of the two-tier currency transaction tax – a modified Tobin tax - with a view to stabilise currency fluctuations (Spahn 1996 and 2006, and Nissanke 2005). In Tobin’s own words, acting in ‘sand in the wheels’, a currency transaction tax is to set to ‘make exchange rates reflect to a larger degree long-run fundamentals relative to short-range expectations and risks’ by strengthening the weight of *regressive* expectations relative to *extrapolative* expectations (Tobin, 1972 and 1978). Under this scheme proposed here, it is envisaged that the multi-tier structure of transaction tax is embedded in a moving target zone system as applied to each commodity, similar to the dynamic price band system in the IFPRI proposal discussed above.

As discussed in literature on the target zone exchange rate regime, a band can perform the function of crystalising market expectations of where the fundamental equilibrium may lie, and thus making expectations stabilizing at the time-horizons relevant for influencing market behaviour (see, for example, Krugman 1991 and Svensson 1992). A successful band regime has also a pronounced effect on limiting price variability by preventing noise traders, particularly stop-loss traders, from making money by introducing noise into markets (Rose 1996). Naturally, establishing a band has a stabilizing effect on prices only when credibility to defend is maintained. Hence, it is important first and foremost to build credibility into a system, so that expectations are formed in a stabilizing manner. The transaction tax here is proposed to use as one of the policy instruments to introduce and sustain the required credibility for stabilisation purpose.

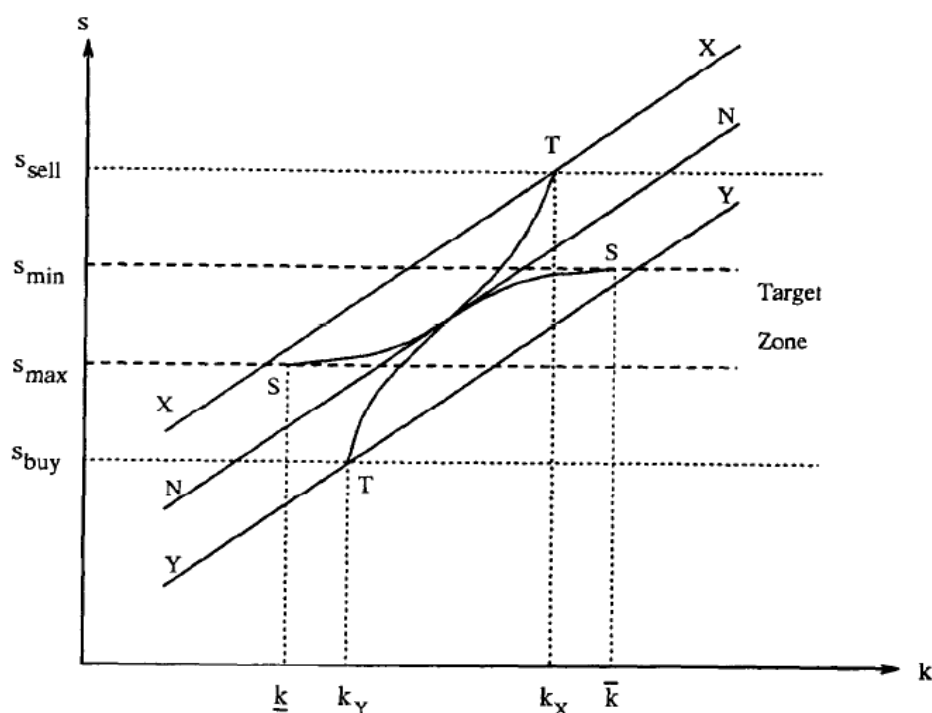
Under the two-tier tax system, for example, the first-tier tax rate is set at zero, or a near zero, rate under a tranquil, normal market condition when prices are within a band, so that

markets can function efficiently with plentiful liquidity. However, once prices start deviating significantly from the target price band, a higher second-tier tax would be levied on portion of derivatives transactions and deals as “surcharges” to curb “excess” in price volatility. Importantly, this system has to be executed under a two-tier structure at minimum, since the credibility of surcharge levy is anchored in the fact that the transaction tax system is already in place. The price surcharge can be administered timely and swiftly only in conjunction with the underlying transaction tax, which would serve ‘as a monitoring and controlling device for the price surcharge. Then, the surcharge would function as ‘an automatic *circuit-breaker* at times of speculative attacks’ as envisaged in its application to currency markets by Spahn (1996: 24). In a less volatile condition, neither liquidity nor market efficiency is impaired or compromised, as a zero or a near-zero rate is applied. At the ‘speculative end’, however, the high price surcharge would be applied temporarily to tame the markets. Under a multi-tier system, tax rates can be varied in a more refined manner as market conditions change.

Indeed, once such system is seen to be operating efficiently with credibility, the *threat* of a surcharge levy alone may well be sufficient to keep prices within a target zone, without resorting to costly sizable holding of reserves or buffer stocks. The system allows breathing space for orderly realignment of commodity prices to shifting fundamentals. In this context, it should be noted here that the band in the proposed multi-tier tax scheme would be a moving one that reflects continuous changes in fundamentals. Further, the width of the band should be also adjusted in according to the way changes in fundamentals evolve, while the band is always better to be set wide enough to allow a margin of error of forecasting, possibly due to high uncertainty as well as not to undermine liquidity. The prime aim of the scheme is not to set and defend a particular narrow price band pre-negotiated as embedded in the earlier stabilization mechanisms, but to prevent excessive price volatility not warranted by market fundamentals such as those observed in 2008-09.

The scheme is deemed as successful, when it drives destabilising speculation out of markets and the surcharge is never levied. With credible intervention through the threat of imposing a high tax rate when traders cross some critical thresholds, markets should become neither dominated by uninformed, noise traders nor contaminated by noises.

In this sense, the scheme operates as a virtual intervention with a view to achieving commodity price stabilization through the “announcement” effect or “honeymoon” effect, as discussed in Krugman (1991) and Krugman and Miller (1993). Aiming at working effectively on traders’ expectation formation with regard to price development, the proposed stabilization scheme should make price dynamics to follow the path depicted by the SS curve within the target zone than that tracing the TT curve, which would be the likely path generated by market forces in the absence of credible intervention (Fig.6).

Fig.6 Mechanisms of Target Zone Schemes

Source: Krugman and Miller (1993)

As in the IFPRI proposal, the credibility and effectiveness of this scheme would rest on how well the future price development is forecasted in terms of market fundamentals and how closely the moving target zone could be designed and implemented to reflect such an evolution of fundamentals. These requirements demand highly information- and knowledge-intensive activities from those international agencies and institutions to which public confidence in their competence will be bestowed to ensure success. Several specialised UN institutions such as UNCTAD or Common Fund for Commodities (CFC) can be seen as potential candidates to perform this vital role in close collaboration with international commodity agencies and councils existing for numerous commodities. The success of the scheme also depends on the political exigency and willingness of the global community to support price stabilisation schemes such as these proposed here. It can be recalled that the lack of such strong political and financial support has led to the demise of the earlier stabilisation schemes.

7. Concluding Remarks : The Developmental Impact of the proposed Scheme

Throughout the 1980s and 1990s when many commodity-dependent low income countries faced severe economic and debt crisis, the commodity related development issues were not featured in the policy debate, in particular, in official positions taken by the IFIs on resolution of the protracted crises. Over the last decade or so, however, an almost unanimous consensus has emerged that vulnerability to external shocks represents a major factor behind their economic and debt crisis since the 1980s and possible risk of developing a renewed accumulation of unsustainable external debt stocks in LDCs.³² Yet, there appears to be some persistent reluctance on the part of the global policy making community to grapple effectively with commodity related developing issues through instituting a global facility to address excessive volatilities in commodity prices and to overcome the international poverty trap associated with the high commodity export dependence of these economies.

Hence, in this paper, we set out to make a case, as well as a concrete proposal, for a global action to mitigate the commodity dependent syndrome found in many CDDCs, whose trade linkages to the world economy are still predominantly through primary commodity exports. Most of them have so long locked into a very disadvantaged position for embarking on a sustainable development path in the absence of appropriate global facilities to deal effectively with commodity related developmental issues.

Towards this objective, the paper first introduces the historical debates on commodities and development with reference to these low income countries (Section 2). It proceeds to discuss the commodity price dynamics over the recent decades in terms of evolving demand-supply market fundamentals as well as the intensifying two-way interactions between the commodity and financial markets as amplifying commodity price volatility (Section 3). With these historical debates and recent trends as a background discussion, in Section 4, the paper presents a short review of the global environments for CDDCs so far evolved over the last three decades since the debt crisis broke out in the early 1980s, in which international mechanisms of commodity dependence syndrome- an international poverty trap- has deepened. It is argued that this has acted as an impediment to achieving broad-based economic development in CDDCs. The paper then discusses briefly the evolving governance structures over commodity markets, trade and production both at the global and national levels.

The hypersensitivity to externally originated instability is one of the critical weaknesses of commodity-dependent low income developing countries. An eventual transformation into more diversified economic structures is the real solution to the problems associated with the “commodity- dependence trap”, discussed in Section 4 of this paper. It is argued therein that developmental problems of these countries could be overcome only through rigorous investment in production capacity and physical and social infrastructures, leading to

³² . See Nissanke (2010d) for detailed discussion on this question. See also Guillaumont and Chauver (2001) for an empirical analysis of vulnerability of CDDCs to external shocks.

transformation of their trade and production structures. To this end, we have to develop strong capacity to manage the transition period with commitment to invest in future on the part of both private agents and the states involved so that the process of active learning-by-doing experiences and accumulation is facilitated.

Yet, we also note that the recent development in commodity markets with heightened price volatility as well as the emerging landscape of commodity marketing and production under globalisation tends to discourage the process of learning and accumulation of critical importance for economic development. These emerging conditions call for a new international framework to improve the share of benefits accruing to producers and producing countries from the integration of their commodity sector with the rest of the world. We should create an environment for strengthening international and domestic institutions governing commodity trade and production throughout commodity chains. Clearly, the rapid increase in commodity price volatility is one of the most worrisome aspects of the recent development in commodity markets with some severe implication for economic development prospects of many CDDCs. Yet, this condition cannot be dealt effectively at the national level in isolation by the CDDCs themselves. This calls for serious rethinking and reappraisal with a view to creating a new international system of managing commodity-related developmental problems that has remained unresolved for more than 60 years throughout the post-war period.

Setting our discussion in this specifically developmental perspective, we suggest that a global facility is required on the two fronts with innovative elements to suit a new challenge facing the global community in the 21st century: a) a set of innovative schemes to reduce excess in commodity price volatility, which are distinctly different from the earlier schemes operated under the International Commodity Agreements of the 1980s; and b) a new compensatory financing facility such as a state-contingent financing facility as a basis for counter-cyclical macroeconomic demand management to facilitate sustainable socio-economic development in CDDCs.

While the *second* global facility and a concrete proposal for state-contingent aid and debt contracts are discussed in detail in Nissanke (2010d), it is predicated on the recognition of the reality that many LDCs find it hard to conduct successfully counter-cyclical macroeconomic policy at the national level on their own. This is not only because of its implementation requires high technical knowledge and capacity, but because the opportunity cost of holding savings abroad is perceived too high in the light of immediate pressing needs to accelerate economic development and to reduce debilitating poverty. Though we stress the importance to make efforts in conducting prudent counter-cyclical managements of resource rents over commodity price cycles at the national level, we suggest that an international scheme at the global level is required. Our proposal is a counter-cyclical financial facility for CDDCs that ensures fast disbursement of aid with low-policy conditionality and high concessionary elements upon negative commodity price shocks.

Specifically, we argue strongly for restructuring aid and debt contracts, so that genuinely flexible, *state-contingent* debt relief mechanisms would be made available in order to avoid a recurrence of debt crises and the debt overhang conditions developing, which has stalled economic development of commodity-dependent LDCs for so long. This is because the state-contingent schemes could make a distinction between the consequences

of a debtor's own efforts and events beyond its control. Such a contract can specify their contractual obligations contingent on the nature of states, and hence deal explicitly and effectively with uncertainty associated with exogenous shocks and systemic risks that are present in any inter-temporal financial transactions. It is also a more efficient, incentive-aligned contract as it allows a contracting party to focus efforts on what is under his/her control.

In this paper, we focus our discussion on the *first* global facility. For presenting a case for the proposed facility, we examine, in Section 5, the mechanisms of how the financialisation of commodity markets with the expansion of derivatives markets have amplified price volatility in excess of what could be explained in demand-supply fundamentals by examining market microstructures. Based on our analyses, it is argued that unregulated trading activities in markets and dealings with the use of derivatives instruments by financial investors with little interests in physical commodities may have generated excessive volatility.

Based on our analysis, in Section 6, we suggest that the scale of *excess* can become so large from time to time that stakeholders in physical commodities could not rely on price signals emanating from markets for making informed decisions concerning future demand and supply developments, including decisions affecting investment and technological progress required for substitution and conservation of resources. In this context, we made a fresh case to tame excessive volatilities in commodity prices in the light of the recent large price swings that have severely strained the global economy and contributed to the current global economic crisis. In our view, the failure of the previous commodity stabilisation schemes through buffer stock management and export quota allocation embodied in the International Commodity Agreements of the 1980s cannot be used as a legitimate and easy excuse for no action.

The paper considers a new generation of innovative schemes with use of a virtual reserve holding of individual commodities or multi-tier transaction tax. These schemes are designed for influencing effectively on traders' expectation formation with regard to price development. In both schemes, the credibility and effectiveness of these innovative mechanisms would rest on how well the future price development is forecasted in terms of commodity market fundamentals and how closely the moving target zone could be designed and implemented to reflect such an evolution of fundamentals. These requirements demand highly information- and knowledge-intensive activities from those international agencies and institutions to which public confidence in their competence will be bestowed to ensure a success of an operation, as part of provision of global public goods.

An establishment and successful operation of these schemes would also depends on the political exigency and willingness of the global community to support innovative schemes to reduce excessive price volatility. It can be recalled that the lack of such strong political and financial support has led to the demise of the earlier schemes of international coordination and compensatory financing facilities.

Over the last three decades, economic globalisation and integration has largely proceeded with increasing intensity, relying on the presumed self-regulatory capacity of markets without adequate structures and systems in place to govern the process (Nissanke 2007,

Nissanke and Thorbecke, 2010). In addition to environmental challenges posed by the climate changes, this has led to the appearance of large cracks in the international economic system, threatening the stability of the world economy on two fronts: the excessive high volatility in primary commodity prices and the global financial crisis.

It is high time for us all to draw proper lessons from these past experiences and to address new challenges facing the global community. We should work collectively on technical details of these innovative mechanisms, so that we can make a global governance system and environment truly development-friendly for CDDCs.

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