

EVOLVING STRUCTURE OF WORLD AGRICULTURAL TRADE AND REQUIREMENTS FOR NEW WORLD TRADE RULES

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ABSTRACT

The recent world food crisis of 2007-08 alerted the world and policy makers to the fact that global agricultural productivity growth has been slowing down, and highlighted the fact that current national agricultural trade policies and the current world trade rules as agreed in the World Trade Organization (WTO) Agreement on Agriculture may not be adequate to prevent such crises in the future. At the same time changes in climate may be precursors of more potential food crises, with significant negative impacts on many poor across the world. This necessitates a reconsideration of the factors that drive long term agricultural trade, and the needs of future global agricultural trade rules.

The objective of this paper is to highlight and analyze several factors impinging on future agricultural trade developments, in order to identify possible needs for future global agricultural trade rules. The paper first documents the recent food events and discusses factors behind these developments. It analyses the pattern of global agricultural market instability over the past 40 years and the factors that may affect it in the futures. New challenges facing the world agricultural trade system are analyzed next. Then a discussion of the growing vulnerability of some developing and least developed countries is illustrated. The paper finally tries to identify areas where the WTO system of rules on agricultural trade may need strengthening or adaptation.

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1. INTRODUCTION

The recent world food crisis of 2007-8 alerted the world and policy makers to the fact that global agricultural productivity growth has been slowing down, and highlighted the fact that current national agricultural trade policies and the current world trade rules as agreed in the World Trade Organization (WTO) Agreement on Agriculture may not be adequate to prevent such crises in the future. At the same time changes in climate may be precursors of more potential food crises, with significant negative impacts on many poor across the world. This necessitates a reconsideration of the factors that drive long term agricultural trade, and the needs of future global agricultural trade rules. The objective of this paper is to highlight and analyze several factors impinging on future agricultural trade developments in order to identify possible needs for future global agricultural trade rules. The main point made is that the need to deal with potentially unstable global agricultural markets will necessitate some potentially new world trade arrangements.

The sudden and unpredictable large increases (spikes) of many internationally traded food commodity prices in late 2007 and early 2008 caught all market participants, as well as governments by surprise and led to many short term policy reactions that may have worsened the price rises. Many governments, think tanks, and individual analysts called for improved international mechanisms to prevent and/or manage sudden food price rises. Similar calls for improved disciplines of markets were made during almost all previous market price bursts, but were largely abandoned after the spikes passed. The financial crisis that started to unravel in 2008 has coincided with sharp commodity price declines, and food commodities have followed this general trend. The price volatility has been considerable. For instance, in February 2008, international wheat, maize and rice price indices stood higher than the same prices in November 2007, namely only three months earlier, by 48.8, 28.3, and 23.5 percent respectively. In November 2008, the same indices stood at -31.9, -3.2, and 52.3 percent higher respectively, compared to November 2007. In other words within one year these food commodity prices had increased very sharply in the first part of the year, and subsequently declined (except rice) equally sharply. Clearly such volatilities of world prices creates much uncertainty of all market participants, and makes both short and longer term planning very difficult for all.

The high food commodity prices coincided with high prices for petroleum, and many mineral products, but not with high prices for many agricultural products of export interest to many developing and least developed countries (LDCs) and in particular those in Africa. Hence, the recent commodity price boom may not have benefited, and in fact may have hurt most such economies. Given the size of the external shock, one may question how poor agriculture-dependent economies fared during the crisis, and whether this type of external shock adds to the already vulnerable and fragile state of many of these economies.

Many developing countries and especially those in Africa have always had exports concentrated in primary commodities, and it is well known that these commodities are characterized by volatile world prices. This implies that the terms of trade for most such economies have been volatile. Nevertheless the (negative) impact of this instability on economic performance has not been explored at the macro level until recently (e.g. Collier and Dehn, 2001, Guillaumont and Chauvet, 2001, Collier and Goderis, 2007, Guillaumont and Korachais, 2006, Blattman et. al. 2007). Another issue, also well analyzed, albeit not resolved, concerns the possible existence of persistent negative trends of the prices of primary commodities (for a recent review see Cashin and McDermott, 2006). The combined negative effects of negative trending and unstable terms of trade for African economies is one of the reasons for their alleged negative performance.

A more recent but less analyzed development has been the increasing food import dependence of developing countries and especially LDCs, despite ample natural resources for food production. This trend in itself does not necessarily imply any problems, as increased food import dependence may be a natural tendency during the transition of an agrarian economy to one based more on manufacturing and services, and can be managed if the export income generated by the non-agricultural sectors can pay for the increased food imports. Such trends, which have been observed in several now developed or middle income developing economies, have been the natural outgrowth of their transition to more productive and diversified structures, and have been characterized by increased agricultural productivity. Many LDCs, however, do not seem to have followed this trend, and hence their growing dependence on food imports seems to suggest another structural development that may contribute to vulnerability.

A major issue of LDCs and African economies' fragility and vulnerability is what this increased exposure to food imports implies about food security, and the impact of external food market shocks. The issue depends

considerably on the degree to which the vulnerable populations in these countries are exposed to the international market shocks. In other words the issue is whether food insecure households are exposed to international market instability. Here, the evidence appears to be that they are very weakly exposed to international market signals, at least in the short term. The reasons have to do with weak infrastructures, high transactions costs, and government policies. This, however, tends to shield vulnerable agriculture-dependent households from the international markets, which makes them more vulnerable to domestic agricultural income shocks, such as those due to unfavorable weather events. These, in fact maybe more detrimental to these households than the shocks due to external market instability. Hence insulation of food insecure household from international markets can shield them from external shocks but make them more vulnerable to internal shocks. The opposite is the case for households that are well integrated with international markets. This, then, presents a policy dilemma with respect to the optimal degree of insulation of food insecure households from world markets. Keeping food insecure households insulated from world markets makes them less vulnerable to global shocks but more vulnerable to domestic shocks, and the opposite is the case if the degree of insulation is smaller. The optimal degree of insulation then to two types of shocks must depend on the degree of exposure to domestic shocks and global, as well as the relative magnitude of these shocks. Some thoughts on this issue will be made towards the end of the paper.

The plan of the paper is as follows. In the following section we examine the recent food price spikes and food market instability in order to assess whether there are tendencies different than the past ones that may raise new concerns. In section 3 we explore the reasons for world agricultural commodity volatility and prospects thereof. Section 4 discusses medium and longer term developments that are likely to affect global agricultural trade. In section 5 the issue of vulnerability of the food economies of developing countries is taken up. The final section summarizes.

2. RECENT COMMODITY PRICE DEVELOPMENTS IN PERSPECTIVE.

Figure 1 indicates the evolution of monthly nominal international prices (index form) of the main traded food commodities since 1990. It can be seen that the main commodities that have soared in late 2007 and early 2008 were dairy, cereals and oils, while sugar and meat prices do not appear to have spiked in any exceptional way, given the trends since 1990. Similarly (and not shown), other agricultural commodities such as the tropical beverages coffee and cocoa, have not exhibited any marked price changes in 2007 and 2008, compared to the 1990-2006 patterns. As of mid-2008 these spikes have vanished, with most indices returning to historical levels.

While, however, the world price changes in some of the basic food commodities appear significant in nominal terms in relation to the trends of the past twenty years, when examined in real terms, prices during the recent crisis appear still considerably smaller compared to the peaks during the previous major food crisis of the mid-1970s. Figures 2-4 indicates the real international prices (deflated by the US producer price index) of the main cereals and oilseeds, vegetable oils and livestock commodities from 1957 to 2008. It can be readily seen that for all commodities indicated, the real prices at the height of the crisis in 2008 were considerably lower compared to the real prices in the mid 1970s.

Another salient pattern evident in the graphs of Figures 2-4 is that the long-term decline in food commodity prices, that appears to have been in place since the late 1950s, seems to have stopped in the late 1980s and early 1990s, with the trend lines indicating steady, albeit still fluctuating patterns. This suggests that there may have been several slowly evolving factors affecting global food markets that gradually created a situation of tightly balanced supply and demand, where a spike was almost inevitable in response to small shocks. Several of these factors have been discussed and analyzed by many authors and think tanks, as well as FAO. They include the following.

1. Growing world demand for basic food commodities, due to growth in emerging economies, such as China and India. This development has been touted considerably by many observers, but in fact it has been occurring gradually for several years, and cannot account for the sudden price spikes. Furthermore, the rate of growth of these countries' demand or utilization of cereals, the most widely consumed and traded food commodities, for food, feed and other non-biofuel uses, has been decreasing rather than increasing. In fact this is compatible and predicted by conventional economic wisdom, which indicates that as incomes rise, the demand for basic foods rises by less than the rise in incomes.

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2. Demand of cereals for biofuel production. It is true that a significant amount of production of maize in the United States of America, oilseeds in the European Union, and sugar in Brazil have been utilized for biofuel production, often with help from a variety of support policies and mandated alternative energy targets. This has also been occurring over a number of recent years, and accounts for a significant portion of market demand for these commodities, as well as, via substitution, for indirect demand for several other commodities that compete for the same resources, such as land. As this has been occurring for some time, and helped keep prices increasing and strong overall, it is unlikely to have been a major factor for the sudden price spikes, albeit it may have had amplifying effects in an already tight market.
3. The rise in petroleum prices. Petroleum prices started rising in 2004, and continued rising all throughout the past few years, before sharply declining in late 2008. The reasons are largely demand by fast-growing countries with energy-intensive economies, such as China and India. The oil price increase, apart from pushing costs of agricultural production and transport higher, induced a demand for alternative fuels, which in the context of the rising awareness about climate change created a strong demand for biofuels. This, in turn, translated to increasing demand for agricultural raw material feed stocks for biofuel production. Oil price increases accelerated starting in late 2007 and continued increasing rapidly until August 2008 when they started a rapid decline. Food commodity prices, especially those for biofuel stocks, seem to have followed this trend quite closely, including through the spike period of late 2007-2008 and hence one might induce that there is a close link between oil prices and food prices that may have been one of the main contributing factors to the recent food price spike and subsequent decline.
4. Slowing rates of increases in farm productivity. During the more than thirty years since the last major food price crisis of 1973-75, agricultural prices in real terms have been declining due to fast rates of growth of agricultural productivity (both land productivity as well as total factor productivity). In the more recent period, agriculture has been neglected in most developing countries, as the World Bank's 2008 World Development Report aptly illustrated. The neglect not only involved lower productivity growth, via lower investments, but also the perception that agricultural supplies were not a problem in a world of low prices.
5. The gradual decline in global food commodity stocks. The ratio of end of season world cereal stocks to global utilization appears to have decreased considerably between 2000 and 2008. For two of the major cereal commodities (maize and rice) this decline can be accounted for by the decline in the stocks of China. However, whether including or excluding China, world cereal stock ratios for most cereal commodities have not changed appreciably in the last 20 years. Nevertheless, several major cereal producing and trading countries experienced secular declines in end of season stocks. Irrespective of the source of the decline, however, it is a fact that when commodity markets face lower end of season stocks, they react much stronger to any negative shocks.
6. Commodity speculation. This factor has been highlighted by many analysts and politicians, to the point of blaming the organized commodity exchanges for the price spikes. Speculation is an ordinary fact of life in all commodity markets, and is a necessary ingredient of all commodity trade. Any agent who buys a contract for commodity (in the physical or future markets) with the intention of selling it later for a profit can be considered a speculator. Organized commodity exchanges are important institutions for both market transparency as well as the transfer of market risk from physical markets to speculators, and they guarantee transactions via the underlying clearing houses. It is no coincidence that they have evolved and grown over a period of more than two centuries, as they have been perceived as important institutions for managing market risks. The advent of large investments by commodity funds in recent years has raised new issues about the utility of the organized exchanges as risk transfer mechanisms, and about the role of unfettered speculation in persistent price rises. Detailed analyses of recent events (Gilbert, 2009) have suggested that there is only weak evidence that such investments have contributed to the commodity price boom.
7. Macroeconomic factors. While most commodity market analysts look for commodity-specific fundamental factors to explain individual commodity price spikes, there are systemic macroeconomic factors that affect all commodities that have been very influential. The recent commodity boom has involved most traded commodities and not only agricultural ones. One of the key factors that fueled such a boom seems to have been a period of easy money and loose regulation

of financial transactions, which resulted in a fast expansion of global financial liquidity, a weak US dollar, and low interest rates. It is notable that the previous large commodity boom of 1973-75 was also preceded by a period of expanding global liquidity fueled by large US external deficits and loose monetary policies, much like in recent years. It has been shown by research (Abbott, *et al.* 2008, Mitchell, 2008) that US dollar depreciation has contributed around 20 percent to increases in food prices. Frankel (2008), in turn, has made the argument that low interest rates, themselves induced by monetary expansion, encourages portfolio shift into commodities, and also discourages stockholding, therefore, contributing to commodity price rises. There is an additional factor in explaining the abrupt behavior in food commodity prices in the midst of the financial crisis of 2008. Many researchers suggest that commodities – especially commodity futures – have become a new ‘asset class’. First, returns to commodity futures are negatively correlated with returns to traditional financial assets such as equities and bonds. This relationship indicates that commodity futures offer an attractive vehicle for portfolio diversification that reduces the volatility of portfolio returns. Second, comparisons between returns of commodity futures with those of traditional financial assets, such as stocks and bonds, indicate that investment in commodity futures is profitable. Futures and stocks have similar returns, amounting to about 5.2–5.6 percent per annum. This is twice as high as the return from investing in bonds. These observations suggest that commodity futures are not only regarded as providing insurance against price risk for farmers and food processors, but also as an asset which generates returns and can be used to diversify traditional financial portfolios. Given that the commodity boom of early 2008 came to an abrupt stop in late 2008, followed by subsequent strong price declines, in the wake of the global financial crisis, without substantial changes in the underlying commodity market fundamentals, suggests that macroeconomic factors were important in the recent boom.

The important point to highlight is that most of these factors were slow in developing over several years, but cumulatively they created a situation of tightly balanced world supply and demand for many agricultural commodities. Furthermore, they made the demand for the agricultural commodities very price inelastic. The demand curve for agricultural (and other commodities) is price elastic when there are ample supplies (from both production and stocks) but becomes very inelastic when the overall supplies are small, and there is low capacity of the market to absorb or buffer exogenous shocks. As indicated above both the reduction of global stocks, as well as the macro factors that fuelled demand growth, pushed the supply demand balance of most food agricultural commodities in a territory, where small shocks or small changes in perceptions could have had very strong price effects. In fact the food production shocks that happened were small, exemplified by the fact that global grain production declined by only 1.3 percent in 2006, but then increased by 4.7 percent in 2007, and a further 4.8 percent in 2008, despite the fact that some of the major exporting countries such as Australia experienced very sharp negative production shocks (of the order of 50-60 percent in both 2005 and 2006). Such production shocks are rather normal in global food commodity markets, and have occurred on similar scale several times in the past, without causing price spikes. It then appears that production shocks were not the main factor driving the commodity markets, but rather some of the other factors indicated above.

A factor that seemed to have contributed considerably to the recent short-term price spikes is hoarding tendencies and policies affecting the normal flow of commodities. It is well known that the reaction of many private agents as well as governments at the onset of price rises was destabilizing, in the sense that their actions fueled the demand for current supplies, led by fears of impending basic commodity shortages. In other words when market agents realized that there were inadequate buffers in the global markets to ensure smooth supply flows, they started to behave atomistically, to ensure their own smooth supply flow. This created panic buying and hoarding, even when the underlying conditions did not justify it, thus creating the price spikes. The case of the global rice market is a good case in point, where, despite adequate global production and supplies, uncoordinated government actions, such as export bans, created a short term hoarding panic and an ensuing price spike. The realization in mid-2008 that the situation was not as critical as many thought, led to the opposite effect and a sharp price decline followed.

In the context of the events of the last two years, it is interesting to examine the evolution of world market price volatility. Figure 5 plots the indices of annualized historic volatilities (estimated by normalized period to period changes of market prices) of nominal international prices of wheat, maize, and rice over the previous five decades. The figures also exhibit the nominal international prices on the basis of which the

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indices of volatility are determined. The reason for the juxtaposition of the two types of information is to examine visually the relationship between the level of commodity prices and the market volatility. It has been known for long time (Samuelson, 1957) that in periods of price spikes, overall supplies are tight, and market volatility should be higher, hence the expectation is that during periods of price spikes the index of market volatility should exhibit a rise as well. .

A most notable characteristic of the plots in Figure 5 is that historic volatility (as an index of market instability) of most food commodities, while quite variable, appears not to have grown secularly in the past five decades. There also appears to be no clear correlation for most commodities between the two major price spike periods, namely 1973-75 and 2007-08 and volatility. During the first boom period, namely 1973-75, volatilities of wheat and maize appear to have increased markedly relative to previous trends. However, this is not the case for rice. During the most recent boom of 2007-08, the volatility of wheat and rice appear to have increased markedly, but not that of maize. While these observations are just visual and need to be corroborated with appropriate econometric analysis, they raise some questions about the alleged positive relationship between the level of prices and the level of volatility.

3. FACTORS AFFECTING PRICE VOLATILITY OF INTERNATIONALLY TRADED AGRICULTURAL COMMODITIES AND PROSPECTS

There are two factors that traditionally have been considered the main ones in influencing agricultural market price instability. These are the variability of production, and the level of end of previous period stocks. The more variable is agricultural production, the more one expects to observe large period to period price variations, namely larger volatility. In the same vein, the smaller the end of season stocks, the more any new market developments are likely to affect prices, and hence the more variable is market price.

Figure 6 exhibits trends in the coefficients of variation of annual production of wheat, maize, rice, and soybeans computed for four ten year periods ending in 1999, as well as the most recent period 2000-06, and for the five continents, as well as the world as a whole. The data indicates the magnitude of year to year variability of agricultural production relative to the ten-year average of the relevant period, in order to ascertain whether there appear to be any discernible trends.

Concerning wheat, there appears to be a marked decline in world production variability, and significant reductions in production variability of America (North and South) and Asia, which between them account for 60 percent of global production. It is only Africa, which accounts for a small share of global wheat production (only 3.3 percent), where production variability seems to have increased. Similarly for maize, global production appears also to have become less variable, with no apparent significant positive trend in any continent. Global paddy rice production variability also appears to be declining over time. The trend is similar in all continents, except Oceania, which, however, accounts for only 0.1 percent of global paddy production. The trend in global soybean production variability also appears to be negative, with most continents exhibiting declining or at most non-increasing coefficients of variation. It thus appears that one of the main traditional factors that affects price volatility, namely production variability has become less important over the previous 50 years. Hence this factor, if anything, implies lower overall market volatility.

Turning to end of season stock levels, Figure 7 exhibits the end of season global stocks both absolutely as well as share of total utilization for wheat, maize, and rice, and also the same figures without China for the past twenty years. The first observation is that global end of season stocks of cereals do not appear to have been in 2007-8 much smaller in absolute levels than in earlier periods, notably the early-mid 1990s. Stocks increased considerably and reached a peak around 2000-2001 and then the started declining. The decline continued until 2004-5 and these trends occurred both with and without China. After 2005 stocks appear to have increased or at least not decrease in absolute terms.

Turning to stock to utilization ratios, the most interesting observation from Figure 7 is that the ratios seem to follow the same patterns and turning points both with as well as without China. Also, albeit there appears to be a negative trend in the ratio of stocks to utilization for the world, when one examines the whole 30-year period from 1979 onwards, there is no marked negative trend for the ratios if China is excluded from the world total. In fact for rice, the ratios for the world as well as without China exhibit a slight positive trend.

However, China is an important producing and trading country, accounting for 17-18 percent of global wheat production, 15 percent of coarse grain production and 29 percent of global paddy rice production. It also, and for the most recent years for which data is available (2007-8), accounts for 39 percent of global end of season wheat stocks, 30-33 percent of global coarse grain stocks, and 53 percent of global rice stocks. It is clear that, irrespective of whether the Chinese authorities use stocks for domestic market stabilization or for managing their net export/imports of basic food commodities, the size of Chinese stocks is likely to weigh heavily on any market analysis of these commodities, and on price expectations.

Turning now to the newer factors affecting market volatility, the most difficult to analyze is the influence of commodity traders in organized exchanges. The reason that this is very difficult is that the classification of traders as commercial (namely those who have an interest in the actual physical commodity), and non-commercial, that has been adopted in several large exchanges, and on the basis of which some data can be compiled, is not representative of the actual intentions and positions of financial funds, as well as other non-commercial actors (Gilbert, 2009). Data from participation of commercial and non-commercial traders in total open interest in the Chicago Board of Trade (CBOT) and in selected futures markets indicate that the share in open interest of non-commercial traders increased considerably in all CBOT markets between 2005-08, and this is the period of the financial boom. However, this simple contemporaneous development is not a proof of causality. The question is whether the undoubted increase in participation of non-commercial traders in the organized futures and other derivative markets, affected the market fundamentals, and in particular the level of prices and volatility. There is very little research on this issue, but some recent empirical analysis by Gilbert, 2009, and a policy brief by the Conference Board of Canada (CBS, 2008) seem to suggest that it is price volatility that attracts non-commercial and other financial traders, and not the other way around.

A lot has been said about the influence of the unstable exchange rate of the US dollar on commodity markets. It is a fact that in recent years the USD exchange rate has varied considerably against the currencies of other major trading countries. For instance the USD depreciated against the Euro by more than 30 percent between 2003 and 2007. It is also the case, albeit not obvious, that since the prices of most internationally traded agricultural commodities are quoted in USD, a USD depreciation has a considerable influence on USD prices of traded commodities. Figure 8 indicates that a one percent USD depreciation against all currencies, *ceteris paribus*, can have significant upwards influence on all agricultural commodity prices, and for some the relevant elasticity can be as high as 0.8-0.9 (this occurs mostly for livestock commodities, where developed countries are the major traders, and exchange rates most variable). Clearly then it appears that the instability of the USD exchange rates must have contributed significantly to market price volatility. Given recent global financial and production developments, the huge international financial flows they imply from agents looking for safe heavens, it is likely that this instability will continue in the future, and hence this is likely to continue affecting adversely commodity market volatilities.

Apart from the instability of the US dollar, macroeconomic instability is likely to have contributed considerably to commodity markets instability. Gilbert, 2009 in his empirical analysis finds that both money supply as well as GDP seem to Granger cause commodity prices. The influence maybe indirect, for instance through interest rates as Frankel (2008) has already indicated. The current financial crisis does not bode well for monetary stability, especially given the significant monetary expansion that is likely to follow the fiscal stimulus packages now envisioned in most large economies. Hence it is likely that macroeconomic factors will continue adding instability to world commodity markets.

The price of petroleum was already alluded to as an important determinant of agricultural commodity prices, especially for those commodities which can be utilized as biofuel production stock. Schmidhuber (2006) has shown that when petroleum prices are in a certain price range, then oil prices and biofuel stock prices seem to be much strongly correlated. This has been empirically substantiated by Balcombe and Rapsomanikis (2008) and for the sugar-oil-ethanol group. Several analysts have attributed significant influence on agricultural commodity prices from petroleum prices, coupled with biofuel policies (e.g. Mitchell, 2008, Abbott, *et al.* 2008). Despite the rapid fall of petroleum prices in late 2008 and early 2009, the underlying demand for oil in the medium term is real and likely to increase (OECD-FAO, 2008). This is likely to induce a continuing linkage between petroleum prices and biofuel stock prices, albeit not at all periods. As oil prices are likely to be quite unstable given the uncertainties in global economic growth, this most likely will induce

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instability of the agricultural commodity markets, both for those products that are directly related to biofuels, such as maize, sugar and rapeseed, but also in commodities that are substitutes in production.

The final factor that is likely to affect commodity market volatility is country policy actions and reactions to external events. The commodity scare of 2007-08 and the publicity it received made many governments overreact, by measures that were not always effective at achieving their stated objectives. A compilation from a FAO survey of government actions in 77 developing countries during the 2007-08 period revealed that there are only a few countries whose governments did nothing in response to the global commodity crisis. Perhaps surprisingly the region where few additional policies were adopted appears to be Africa. Secondly many developing countries intervened in trade by either reducing import tariffs or banning exports or other measures.

Given the size of the recent international price variations during a single year, (sharp increases in late 2007 and early 2008 and equally sharp price decreases in late 2008), many governments and market agents are rightfully questioning whether this type of extreme market volatility might continue in the future. In this context the following thoughts may be useful in assessing the future prospects for market volatility.

First, it will take some time for food stocks to be replenished, especially if unusual weather events continue to occur over the next few seasons. Despite the fact that prices have come down from their peaks of 2008, and that global production seems to have responded positively to the crisis, the decline in prices may discourage many farmers from further production increases, and governments from productive investments. Hence, stock replenishment may be a slow process, implying that the markets will be tightly balanced for some time to come. With the financial crisis hitting on top of the food crisis, financing will also be scarce for all investments, and this will include investments in stocks. Low interest rates will certainly not make this process any easier, as Frankel (2008) has argued.

Biofuel demand is likely to be important for some time, if petroleum prices stay high. With the global financial and now economic crisis lowering overall petroleum demand, this looks like a less pressing issue, but petroleum prices are highly uncertain, and hence it is not clear that they will come down strongly and persistently. Hence, biofuel demand is likely to stay strong, especially since mandates are likely to stay, and investments made in biofuel producing plants will not be easy to just abandon. Finally, biofuel demand is likely to stay until more energy efficient new generation biofuels that do not compete with land resources for food production become widely available commercially, and this is not likely to happen for several more years.

The final factor that is likely to affect commodity market volatility is country policy actions and reactions to external events. The commodity scare of 2007-8 and the publicity it received made many governments overreact, by measures that were not always effective at achieving their stated objectives. An FAO survey of government actions in 77 developing countries during the 2007-8 period tabulated the type of measures that were undertaken in response to the global price rises. It was revealed that there are only a few countries whose governments did nothing in response to the global commodity crisis. Perhaps surprisingly the region where few additional policies were adopted appears to be Africa. Nevertheless, discrete and largely unexpected policy responses, especially through marketing boards operations, increase uncertainty and weaken the incentive for the private sector to engage in trade. The presence and trading activities of both marketing boards and private firms give rise to a dual marketing system that often increases the fragility of the market. The lack of trust and the poor coordination between the public and the private sectors often result in food deficits and high domestic price volatility.

Based on the above considerations and current projections about world overall economic prospects, the medium term outlook for agricultural commodities is that the growth rate of world demand for agricultural food commodities will slow down in the next ten years but income sensitive products' demand will grow faster. Trade will grow faster than production as in the past. The growth in food demand will be larger in developing countries for all types of products. Supply is expected to keep up with moderate increases in productivity. Nevertheless new demands especially for biofuels are likely to keep prices firm in the medium term.

The overall conclusion then is that the global food commodity markets are likely to stay volatile in the next few years, until stocks are replenished, petroleum prices stabilize, and the global financial crisis works itself

out. An added risk is that the efforts currently made to renew emphasis on agricultural investments to boost productive efficiency, especially in developing agriculture dependent countries, are derailed by the probably short lived hiatus of low global food commodity prices.

4. DEVELOPMENTS IN GLOBAL FOOD AND AGRICULTURAL SECTORS THAT WILL CONDITION FUTURE TRADE POLICIES

There are many events that are likely to shape future agricultural trade and trade policies. The past 30-35 years, namely the period since the mid 1970s and the last food crisis, have seen the emergence of a more globalized food system, and the policy concerns shifted to issues of growth in non-agriculture, and more open trade. The WTO and the debates surrounding agricultural trade have tended to neglect food security concerns. Nevertheless, the recent global food market events have refocused many policy makers' views back towards food security. Apart, however, from this there have been a series of developments that are likely to impinge considerably on global food markets and trade. A selection of these is listed below¹.

4.1 Uneven growth in the global economy

Almost all global projections suggest that growth in the next few decades, whether fast or slow will be faster in developing countries, and especially those of Asia. This will increase demand for the most income elastic food products, such as livestock products, fruits and vegetables. If most of the growth in many of the faster growing economies takes place outside agriculture, then the demand for imports will increase faster than overall demand. Concerns about how to satisfy this growing domestic demand for food is a major factor that will shape developing country agricultural trade policies, as well as their attitudes towards the WTO in the years to come. Similarly, fast growth in non-agricultural sectors may induce the familiar (from the now developed countries) political pressures to ease the adjustment via subsidies to rural areas. This will bring pressures for protection or domestic support. If the WTO constraints countries' freedom to apply relevant policies, then a conflict may arise between the WTO commitments and the domestic adjustment pressures. Hence some policy space may need to be left in WTO commitments of countries that are at different stages of development.

Perhaps more worrying for the world trade system as a whole is the prospect of a serious slowdown in global economic growth being accompanied by political tensions or trade disruptions. Of particular concern are oil supplies which depend on a small group of countries, many with potentially unstable regimes. Periods of inflation and slow growth in the past have been associated with sharp increases in the price of crude oil. While oil prices have eased recently after a sharp increase, most analysts predict that when the global economy exits from the current slowdown oils prices will increase again. Other types of disruptions, of the financial or real type are also not unlikely, and the issue is whether the global trade system as it has emerged over the period since the Kennedy Round can survive a serious downturn in the global economy that could lead to self-preservation policies that in effect destroy the mechanisms that have been laboriously established. Can the trade system as a whole and the agricultural trade rules survive a major 1930s type depression?

4.2 Growth in agricultural output and investment

The recent period of high food prices has brought to the attention of countries the extent to which investments are needed to maintain and increase the capacity of the agricultural sector to meet the demands of a growing population. Expenditure on research has been lagging in recent years, as a result of shifting priorities for public investment and lack of financial incentives for private investment. As was seen in Figures 2-4, the world prices for major agricultural food products have declined in the past four decades, but the trend appears to have slowed or stopped since 1980. Could this trend be due to a slowdown in global agricultural productivity? Figure 9 illustrates that yields of major agricultural food products have increased in developed and middle income developing countries but have stagnated in LDCs. It also illustrates the fact that yield levels are much smaller in LDCs compared to developed and middle income economies. As yield differences reflect largely larger application of modern inputs (better seeds, fertilizers and chemicals) it appears that there is considerable potential for bringing yield levels in developing countries to levels comparable to those of developed countries, but this necessitates considerable investments.

¹ The discussion in this section borrows several ideas from a paper written for FAO by Tim Josling (2008).

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The possibilities for productivity improvements along with prospects for reasonable world prices for food commodities suggests the need for increases in public investment in the production of basic foodstuffs. Complementing this could be an increased interest in infrastructural improvements that are often the constraint on the marketing of local foods in developing countries. Public investment in agriculture however, may be hampered in a context of financial stringency.

On the other hand the role of the private sector will be crucial in keeping supply in line with demand. It is not clear that private investments will be forthcoming in the amounts necessary. There has been a recent resurgence of interest in international investment in agricultural land. Purchases of agricultural land in Africa by various Gulf States for food production have attracted most attention, although these are just one of a variety of actual or planned investment flows with different motivations. Investment companies in Europe and North America are also exploring opportunities motivated by potentially high expected returns on investment partly due to higher food prices and especially where biofuel feedstock production is a possibility.

The motivation for the recent spate of interest is food security and a fear arising from the recent high food prices and policy-induced supply shocks that dependence on world markets for foods supplies has become more risky. At the same time, a number of countries are making strenuous efforts to attract such investments to exploit “surplus” land. Benefits to the receiving country are a major concern. These should arise from capital inflows, technology transfer, employment creation, multiplier effects through local sourcing of labour and other inputs and possibly an increase in food supplies for the domestic market. However, foreign direct investment may create dependence on imported inputs and hence limited domestic multiplier effects.

Since the overall idea of this type of investments is to export the products produced, there are alternative business models for this, for instance contractual arrangements, as has been the pattern for the development of East African horticultural production for export by European supermarkets. It is also important to consider the various trade implications of any overt or hidden subsidies that accompany such arrangements.

4.3 Continued reform towards decoupled support in developed countries

The period since 1985 has seen a paradigm change in the management of the agricultural economy in both developed and developing economies, toward deregulation and the provision of incentives. The policy changes in developed countries in the 1980s have been from market intervention towards direct payments. In the EU this process accelerated over the 1990s as farm policy shifted to include environmental and quality aspects of food production, culminating in the reforms of 2003 that virtually eliminated for arable agriculture any link between farmer support payments and commodity market conditions. Progress in the United States of America has been less linear, with a move in 1996 to delink payments and production but some recidivism in 2002 and 2008 as commodity-based price support programs proved to have strong support in the farm lobby and in Congress.

In light of the new pressures and political demands coming from the recent food scare and the financial crisis, the issue for the next few decades is whether the reform process will continue towards agricultural policies that aim specifically at issues of productivity enhancement and risk management. Such a trend would be consistent with a more open trade system and the removal of the many impediments that developing countries face in supplying food to the industrial country markets. However, the pace of reforms could stall if the Doha negotiations are delayed or even abandoned.

4.4 Continued policy reform in developing countries

The more fundamental question is whether developing countries will follow the same pattern with respect to the protection of domestic markets and producers. Much of the impetus for public intervention in developed country agricultural markets came as a reaction to different patterns of adjustment of the agricultural and the non-agricultural sectors.

That the issue of appropriate trade policy at different levels of development needs to be addressed further is suggested by the fact that current protection levels by sector seem to be related to the stage of economic development. Tables 1, 2 and 3 exhibit a snapshot of some recent (circa 2001) data on the pattern of protection in agricultural, processed food, and non-agricultural non-food products, by developing and developed countries as represented by the ad-valorem equivalent. The major observation from these tables is

that concerning agricultural products, the developing countries (except China and India) exhibit lower protection than most developed countries, especially the non-US and non-EU ones. Concerning processed foods, both developed and developing countries appear to have substantial but similar levels of protection, while for non-agriculture non-food products, protection in developing countries is generally higher than that of developed countries. LDCs in particular appear to have rather moderate levels of protection for both agricultural as well as non-agricultural products.

If the historical pattern of agricultural protection, as exhibited by the cross sectional evidence of the tables suggests that agriculture is first unprotected or even taxed at early stages of development, then goes through a cycle of protection and support during the period when the country achieves middle income, and finally it is liberalized, then attempts in WTO to bind current levels of protection and support may prevent some developing countries and LDCs from the flexibility needed to pass through the middle income phase of their development. It is not clear whether the rate of protection of agriculture will need to go through the historically traditional pattern in the now developing countries. However, if it does, and if the WTO new rules on agriculture do not allow it, then this may create pressures for other types of support that maybe deemed compatible with the WTO. Or in the worst case this may threaten the WTO itself. In order to prevent this it may be appropriate to allow for appropriate policy space for developing countries for the agricultural trade related policies.

4.5 Global volatility of prices and food security

This issue was already discussed above, and the result was that the world is likely to face increased uncertainty and likely volatility in agricultural trade. It is interesting to note in this context that the data in Figure 5 suggested that world price volatility has not changed significantly in the last forty years despite the fact that trade has been liberalized and world agriculture has become more globalized.

Price instability can undermine the legitimacy of the global market as a place in which countries can buy food supplies on a regular basis and make use of trade to supplement domestic production. The WTO rules are currently unbalanced: they spring into action when prices are low but do little to constrain government action when prices rise. So export subsidies are constrained and tariffs are bound, but export taxes are not limited and export embargoes barely mentioned. The ability of the world trade system to respond in times of price volatility is likely to be tested severely in the future, and some creative institutional arrangements may be needed.

4.6 Continued concern for environmental impacts of agriculture

One issue that was almost entirely absent from the discussion of agricultural policy in the 1960s was the impact of agriculture on the environment. Now it is rapidly becoming an important part of the equation when domestic and international farm policies are being decided. Agriculture emits about 14 percent of all greenhouse (GHGs) in the atmosphere but can also contribute to GHG reduction. The EU has to a large extent taken the lead on this issue by making farm support payments conditional on good environmental practices. But other countries are following down the path of recasting income support as compensation for environmental stewardship and the provision of public recreational goods. Other environmental issues (beside the biofuel subsidy issues) include the contribution of agriculture and forestry to carbon sequestration and the problems caused by methane emission by livestock.

The trade system is set up to recognize goods by their product attributes not by the process attributes that one needs to evaluate a carbon footprint. On the other hand once the concept of life-cycle analysis of products takes hold in national legislation the differentiation of goods by their method of production becomes inevitable. So until this disconnect can be resolved, one would expect increasing conflicts over the issue of the environmental impact of the production and processing methods of traded goods. Will this issue increase or decrease trade in foodstuffs? Increasing product differentiation is generally positive for trade. A variety of environment friendly biotechnologies may need to source materials from other countries with appropriate production conditions, hence making trade an important attribute of this new industry. However, more trade, especially of bulky products, may bring forth the issue of the environmental impact of transportation services. Policies to deal with the environment may include carbon taxes which may encourage local production at the expense of overseas supplies. The conclusion is that the rules on trade and environment will become more complicated.

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4.7 Continued concentration and value chain development in the food system

Recent research has demonstrated that world trade in most products, and food products are no exception, is dominated by a few large multinational firms. While this has resulted in more diverse and cheaper food, as well as provided more consumer choice, especially in developed countries, a side effect is that corporate decisions can affect millions of farmers and consumers. Concern has grown that concentration of economic power could at some stage constrain rather than empower farmers and consumers.

Much trade in manufactures moves within the same firm, as supply chains lengthen. The same trend is noticeable in food trade. While within national borders many countries, especially developed ones, apply antimonopoly and antitrust laws, such rules are non-existent in international trade. Competition issues are part of the so-called Singapore issues that many countries deemed not desirable as part of the current Doha agenda. One of the main problems that hamper developments in this area is lack of appropriate data, as well as a legal vacuum. For instance, if a multinational company is monopolizing a market, which national or international authority should be responsible for disciplining it? Whether and when competition policy will re-emerge remains to be seen.

4.8 Consumer-driven food attributes and the rise of private standards²

The main manifestation of globalization of the food sector may have been the establishment of global supply chains: the driving force behind such chains has been supermarkets and food processors. The consumer has played a willing role in this development. In developed countries the successful attempt to package attributes of health and environmental responsibility with foodstuffs, along with animal welfare and in some cases labour conditions, has transformed the economics of food trade. In developing countries consumers have embraced the availability of non-local foods and the better reliability and quality control that can come with firm size and management expertise. Most of these tendencies have given rise to private standards that are additional or different than those that apply under the Sanitary and Phytosanitary (SPS) Agreement of the WTO, which tried to control the ability of governments to set import standards that were not justified by risk assessment and based on scientific evidence. The SPS Agreement itself has been useful, particularly in the area of animal and plant diseases, but has not been effective in the area of private standards.

The lack of jurisprudence over private standards coupled with their rapid flourishing has given rise to numerous issues in the global food sector. These issues can be grouped into two categories: legal issues that relate to the multilateral agreement construct of GATT, SPS, and TBT agreements and practical issues over the consequences of private standards, especially to developing countries, and the proposed solutions to solve or abate these consequences.

The legal issues address how GATT or the SPS and TBT agreements deal with private standards. What is the relationship between the SPS agreement and private standards? What is the applicability of the TBT agreement to private standards, particularly the Code of Good Practice? The answer to these questions depends on resolving certain definitional problems in the SPS and TBT agreements. The lack of jurisprudence makes answering these questions difficult. This in turn makes it difficult for national governments to determine whether private standards are a legitimate private-sector activity, with which governments should not interfere, or whether the SPS/TBT agreements obligate governments in importing countries to be responsible for private standards.

Especially problematic to the analysis is the blurring of the line between private and official standards. At what point does the interaction between a government body and a private-standard setting body render meaningless the distinction between “voluntary” private standards and official standards? What will be the result when a government standardizing body develops a national safety standard based on a privately-developed standard or when a Member permits entry of imported goods conditioned upon certification with a private standard that exceeds official requirements? These issues are not addressed in the WTO jurisprudence and are not readily answered by the SPS and TBT agreements.

Equally complicated is the issue of what legal consensus might be found. What would be the result if private standards were challenged under the WTO? What would be the implications of an attempt to expand the jurisdiction of the SPS and TBT agreements over private standards? Would these results and implications

² The discussion in this subsection borrows from a paper written for FAO by Roberts (2009).

threaten the viability of the international food-trade system? In working towards a consensus, are there co-regulatory approaches under the WTO that can be used? Should regulatory space be specifically carved out for private standards? What should be the role of intergovernmental standard-setting bodies? Is the multilateral monitoring of private standards desirable and feasible? These issues are complex and not easily answered.

The most pressing practical issue that emerges from the employment of private standards in the global food supply is how do small producers cope with the costs of compliance? Are there alternatives to certification that could make a more practical and affordable model for small-scale producers while ensuring equivalent assurance outcomes? Can there be practical interpretation of standards to minimize unreasonable demands and opportunities for adding value? Is there a model that both addresses the specific needs of the retail supply chain and is practical and affordable for small-scale producers?

The question that countries will have to face is whether to try to amend the SPS Agreement to allow government regulations to respond to consumer concerns that have not been found to have scientific merit. In the absence of some sort of solution to this problem the SPS Agreement will increasingly become irrelevant for most food trade.

4.9 The proliferation of regional and bilateral agreements

Will the global food market begin to fragment as more regional and bilateral trade agreements are concluded? Or will these regional and bilateral effectively merge to create global free trade? The large countries or trading blocs such as the EU, United States of America, and Japan have already concluded many bilateral and regional trade agreements and more are under negotiation. Agriculture, if included at all, is usually included but in a careful manner not to upset the status quo and entails many exemptions.

There is an inherent asymmetry in such agreements, as the larger country with a larger market has an advantage over a smaller one. Preferential access to the larger market is usually bought at the cost of freer entry of the developed country partner's product in the market of the smaller country. However, a major obstacle to taking advantage of such agreements is adherence to the Rules of Origin (RoO), which can place undue cost and burden on many administratively weaker economies, with the consequence that the potential benefits from an agreement are not realized.

4.10 Growing water scarcity and increased food emergencies due to climatic shocks

Currently half a billion people live in countries chronically short of water. By 2050 the number will rise to more than four billion. As agriculture is the most significant user of water resources accounting for 69 percent of world fresh water use in 2000, it will be affected considerably. The growth of irrigation has contributed to increased agricultural productivity and production in the past, but under conditions of increasing water scarcity in many parts of the world (and especially according to the Inter-governmental Panel on Climate Change (IPCC) report on climate change in low income developing countries) this may not continue. Currently only 17 percent of the world's arable land is irrigated but that land produces over one third of the world's total food supply. Irrigation efficiency varies considerably by country and various subsidies and lack of appropriate pricing mechanisms tend to pervert incentives for efficient water use.

Also agricultural water needs change with changing diet patterns. While on average it takes about 2000 litres of water to produce the amount of food consumed by one person in one day (and this is about 500 times the amount of water drunk directly per person per day) this varies considerably depending on the type of food consumed. For instance one kg of rice grown in paddies requires about 1900 litres. But one kg of beef needs as much as 15 000 litres. The point is that changing incomes and diets coupled with changing water availabilities will lead to demands for more agricultural trade from regions that have abundant water resources towards those that have lesser such resources.

Growing water scarcity in several parts of the world due to climate change has been accompanied by increasing variability of production and attendant food emergencies. Figure 10 illustrates that the number of annual food emergencies and in particular those that are due to natural disasters has increased considerably over the past twenty years. This implies that food trade and in particular growing needs for emergency assistance will be another factor that will have to be taken into account by the global trading system.

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5. FOOD DEPENDENCY AND FOOD INSECURITY AMONG LESS DEVELOPED ECONOMIES

Over the past 40 years, and despite significant developments in global trade, technology and aid, many developing countries but especially those in Africa have remained very dependent on agriculture. Table 4 indicates that both for Africa as a whole and for LDC Africa in particular the share of agriculture in GDP has decreased only slightly since 1970. During the same period, the share of economically active population employed in agriculture, while experiencing significant decline for Africa as a whole, from 76 percent in 1970 to 57 percent in 2002-4, in LDC Africa the share decreased from 83 percent to a still very high 71 percent. Despite this continuing dependence, Table 5 indicates that the shares of agricultural exports in total exports of merchandise as well as total exports of goods and services have declined to about half their shares in 1970.

This decline in agricultural export shares has been accompanied by growing agricultural imports. Table 6 indicates that during the same period, the share of agricultural imports in total imports of goods and services has declined, but the share of imports in total merchandise imports has increased, with the exception of North Africa. More significantly, the share of agricultural imports in total exports of goods and services, an index that can indicate the ability of the country to finance food imports, while declining from 1970 to 1980 and 1990, has increased considerably from 1990 to 2002-04. This suggests that agricultural (mostly food) imports have necessitated a large share of the export revenues of African countries.

Among Asian developing countries, by contrast, over the same time period the average share of agriculture in GDP has declined from 37 percent to 22 percent, the share of economically active population employed in agriculture has declined from 70 to 51 percent. The share of agricultural exports in total exports of goods and services has declined from 28.4 percent to 7.8 percent (as a share of merchandise exports the share of agriculture declined from 46.5 to 8.7 percent). The share of agricultural imports in total imports of goods and services has declined from 33.0 to 7.8 percent, and the share of total food imports in total exports of goods and services has declined from 15.5 to 7.1 percent. Hence Asian developing countries' food imports have not increased beyond their capacity to import them.

In Latin America and the Caribbean (LAC) by contrast agriculture as a share of GDP has increased on average in all regions (except Latin Caribbean) over the past 25 years (from 7.1 to 8.1 percent) while the share of economically active population in agriculture has declined from 34.5 to 18.6 percent. For most LAC countries exports of agricultural products constitute a large share of total merchandise exports (average about 35 percent), and agricultural imports are on average less than 20 percent of total merchandise imports. Hence the issue of growing food imports with inability to pay is mostly an African problem.

These developments have been accompanied by a decline in the income terms of trade for LDCs, which are largely African countries. Figure 11 indicates that during the period 1960-2002 the income terms of trade, as computed by the ratio of the value of agricultural exports to an index of import prices (the IMF Manufacturing Unit Value index), and which measures the purchasing power of agricultural exports, seems to have evolved totally differently for developed countries, LDCs and other (middle income) developing countries, with the index for the LDC showing a continuing decline, while that of the developed and other developing countries an increase. The basic reason for this development, since both groups of countries face the same international prices is the different rates of productivity growth as was illustrated in Figure 9. It is clear from that figure that in the last 20 years productivity increases have been strong in developed and other developing countries, while they have been very weak in LDCs.

Two other interesting structural developments are in order. The first concerns the fact that despite the fact that agricultural export dependence has declined for most developing countries, the high commodity dependence of agricultural exports has continued, especially for African countries. The second structural development concerns changes in the production structure of LDC agriculture. After 1980, almost all developing countries and most LDCs adopted stabilization and structural adjustment programs that intended in transforming their economic sectors towards more tradable commodities. This was particularly intended for agriculture, which had been characterized by many institutional and market rigidities and government monopolistic interventions. However, two decades after the onset of such programs the share of agricultural production that is accounted for by exportable and importable products does not appear to have changed very much. As Table 7 illustrates, the average share of the value of exportable production in the value of total agricultural production for 24 low income African countries in 2001-3 was estimated by the authors to be

21.8 percent compared to 23.1 percent in 1980-82. As for the share of import substitute products in total agricultural production over the same period, this seems to have stayed the same from 24.7 percent in 1980-82 to 25 percent in 2001-3.

Turning to medium term food outlook, we present some projections of net imports of the FAO COSIMO model that pertain to developing countries and LDCs. Figure 12 indicates that based on current estimates, developing countries will increase their net food imports by 2016 in all products except vegetable oils. Similarly Figure 13 indicates that LDCs are projected to become an increasing food deficit region in all products and increasingly so. Clearly this suggests that as LDCs become more dependent on international markets, they will become more exposed to international market instability.

The conclusion of this descriptive exposition is that many developing countries and especially LDC countries in Africa, have become more food import dependent, without becoming more productive in their own agricultural food producing sectors, or without expanding other export sectors to be able to counteract that import dependency. This implies that they may have become more exposed to international market instability and hence more vulnerable.

6. CONCLUSIONS AND OUTLOOK

The above discussion has illustrated various aspects of the world agricultural trade economy that may impinge on the future. Given population growth patterns and income projections, the largest challenge in the coming decades seems to be to ensure a global trading system that balances the objective of an orderly and dependable market for food with the objective of growth of many currently developing and least developed countries.

The conclusion of the discussion on volatility is that the global food commodity markets are likely to stay volatile in the next few years, until stocks are replenished, petroleum prices stabilize, and the global financial crisis works itself out. An added risk is that the efforts currently made to renew emphasis on agricultural investments to boost productive efficiency, especially in developing agriculture dependent countries, are derailed by the probably short lived hiatus of low global food commodity prices. This calls for continuing watch on global food markets and developments. In the medium and longer run, growing demand by emerging developing economies is likely to condition world food markets. Given that the conditions for agricultural production are likely to stay favorable (from a technological and ecological perspective) with the more developed and some middle income countries, the future seems likely to produce more trade and especially more north-south trade in agricultural products.

At the same time the food security considerations of many developing but also some developed and oil rich countries that cannot produce the food they need, may induce considerable reordering of the pattern of ownership of production. Significant developments that need to be monitored are on the one hand the tendency of some food dependent economies towards a higher degree of self sufficiency, and at the same time tendencies of some richer food importing countries to negotiate agreements for food production and committed export to their own countries. The institutional context within which these developments will take place and the public-private or state-state types of partnerships and arrangements that will evolve may necessitate a reconsideration of some world trading rules.

Similarly the major structural change in the global food markets is the emergence of the large food multinationals as well as the dominance of supermarkets. The types of international regulatory framework needed to accommodate the challenges and risks of this development have not been considered much until now and will surely pose challenges for the future trading system.

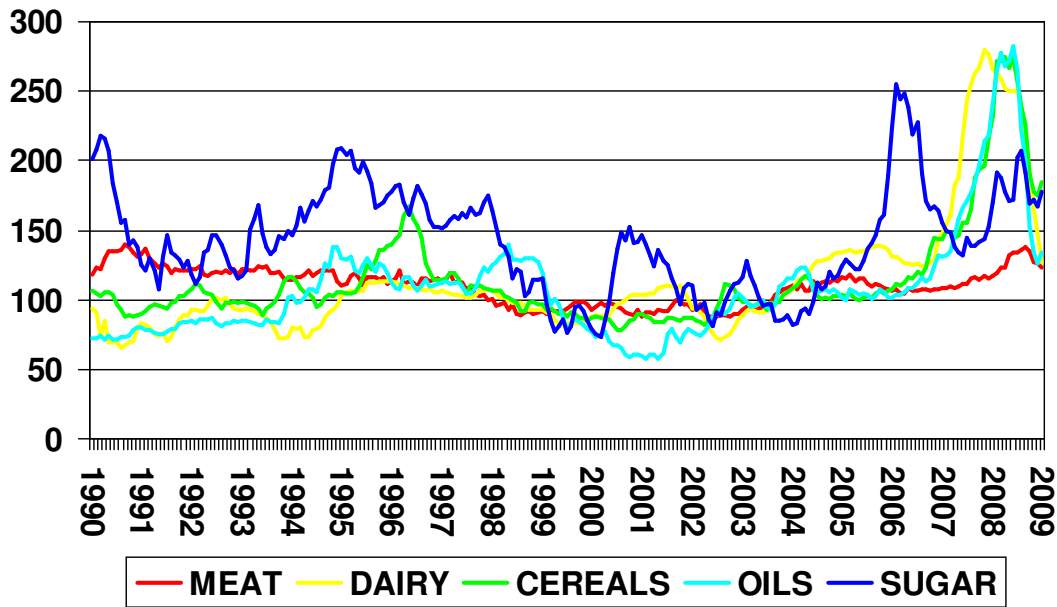
Finally and not least, the global trading system must accommodate rules that can ensure a more stable and reliable food trade. Lack of food creates considerable insecurities across the world and may lead to perverse policies and outcomes. The recent events demonstrated that a more liberal agrifood trading system is not necessarily more stable. It is conceivable that more stability may need more long term contractual arrangements on a country-country or even country-private nature. Regional or bilateral arrangements may create more stability but the trading system may need to ensure that this is not at the expense of more instability of those that are left outside such arrangements. The plight of developing countries must be particularly born in mind. To that end development needs to be a continuing and integral part of the WTO and not one of passing convenience.

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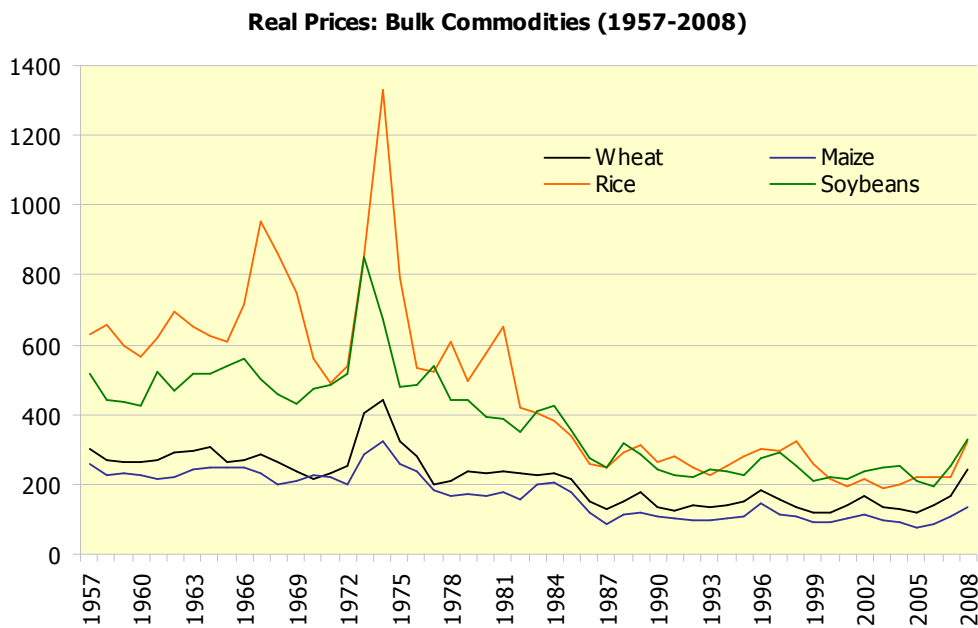
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Figure 1 Recent basic food commodity international price indices (1998-2000=100)



Source: FAO

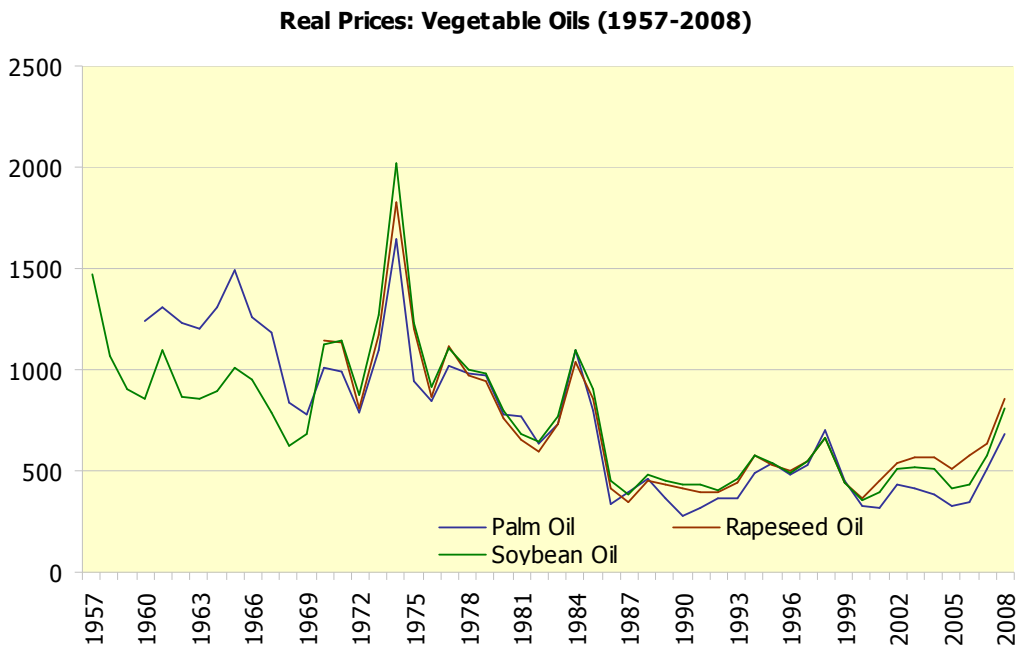
Figure 2 Real prices of bulk food commodities 1957-2008



Source: FAO Trade and Markets Division

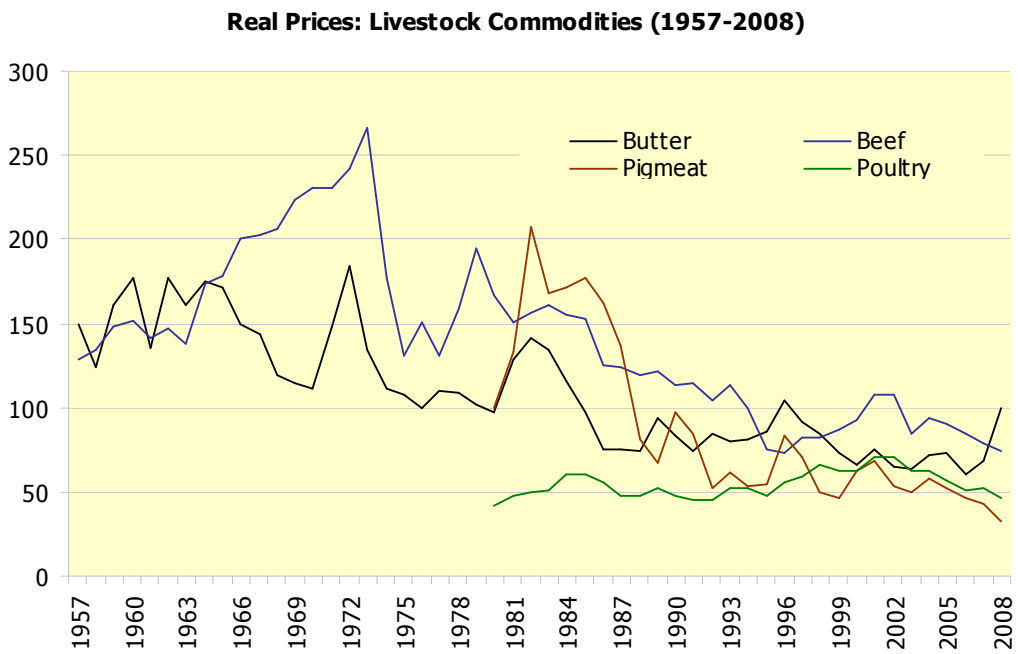
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Figure 3 Real prices of vegetable oils 1957-2008



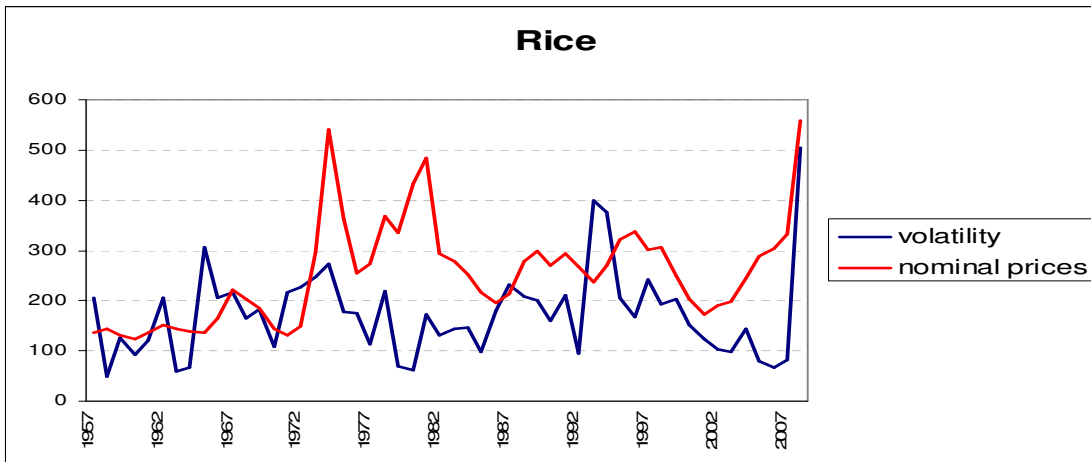
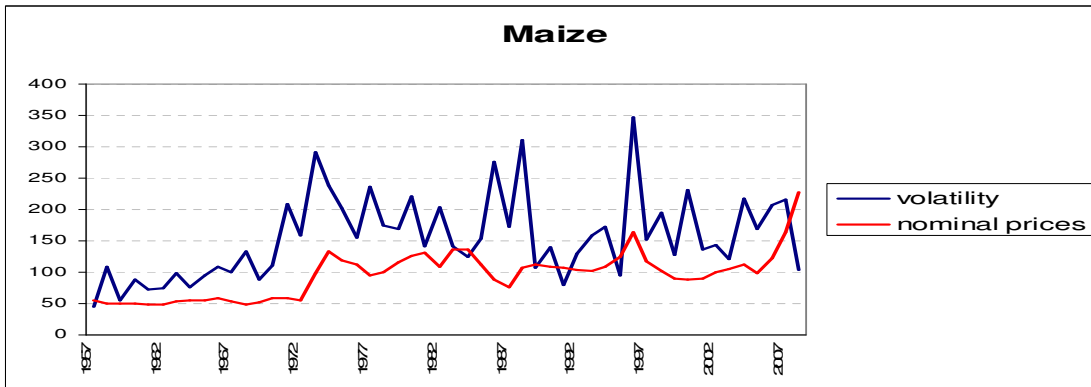
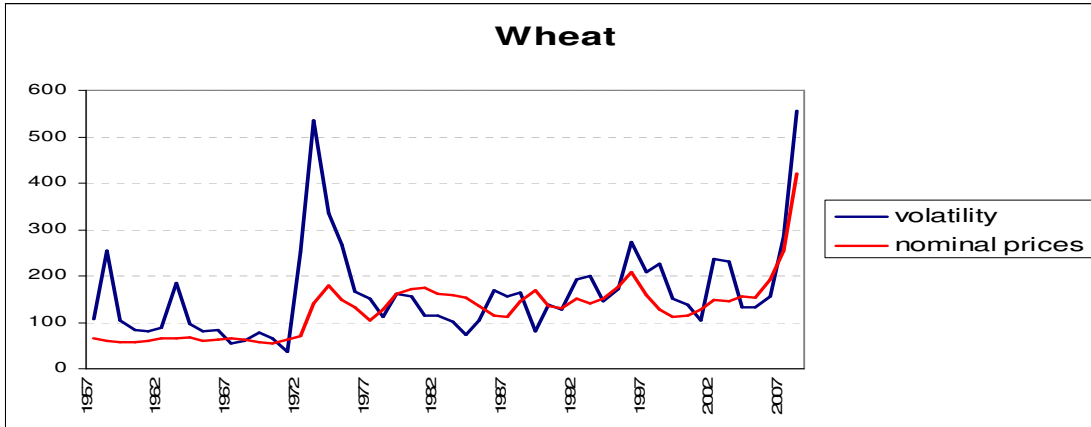
Source: FAO Trade and Markets Division

Figure 4 Real prices of livestock commodities 1957-2008



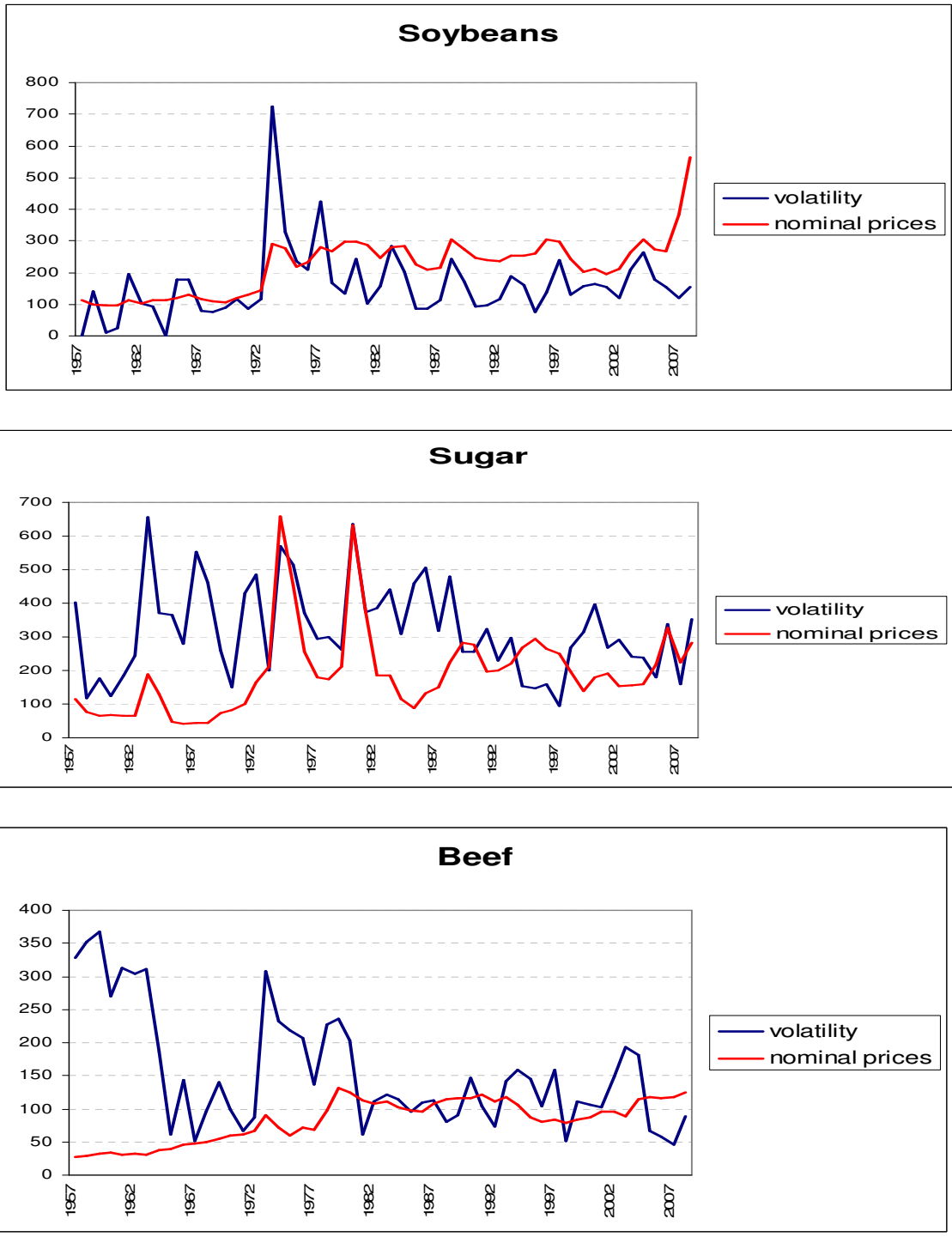
Source: FAO Trade and Markets Division

Figure 5 Historic volatility and nominal international price for the major food commodities



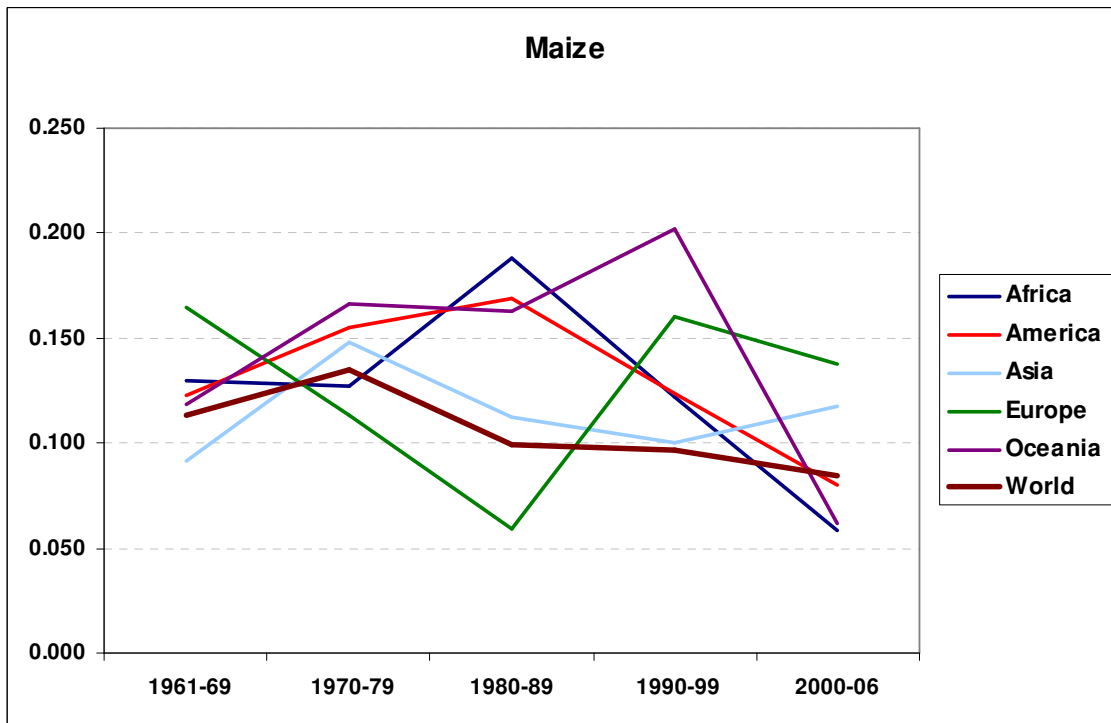
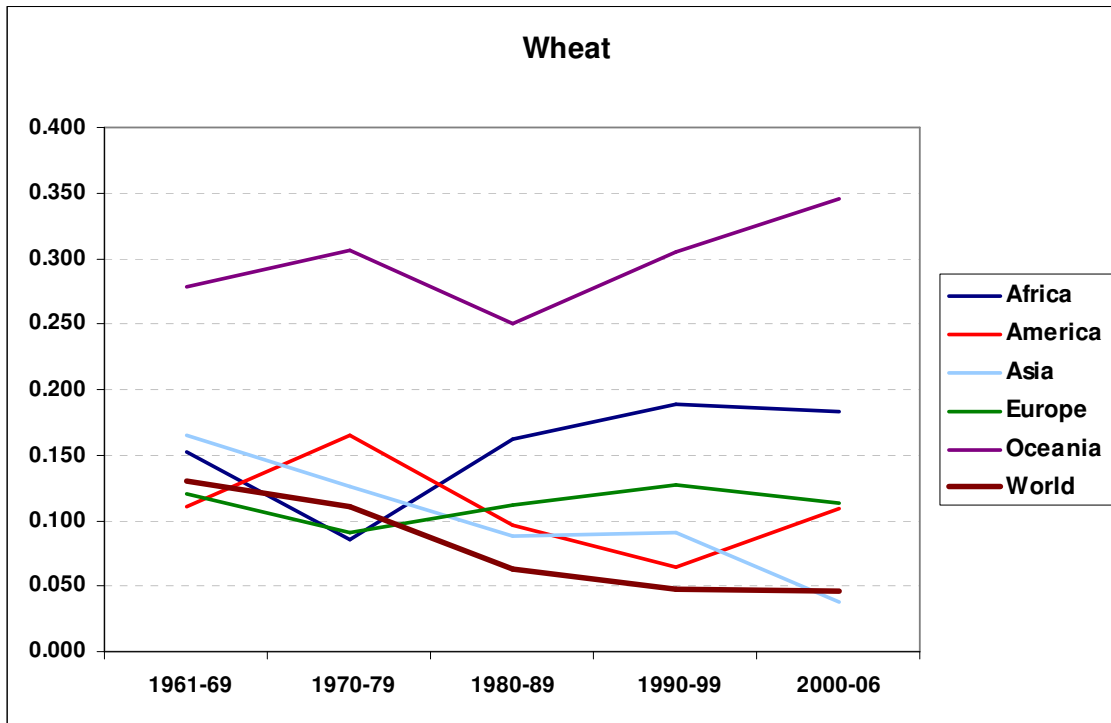
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Figure 5 (continued)



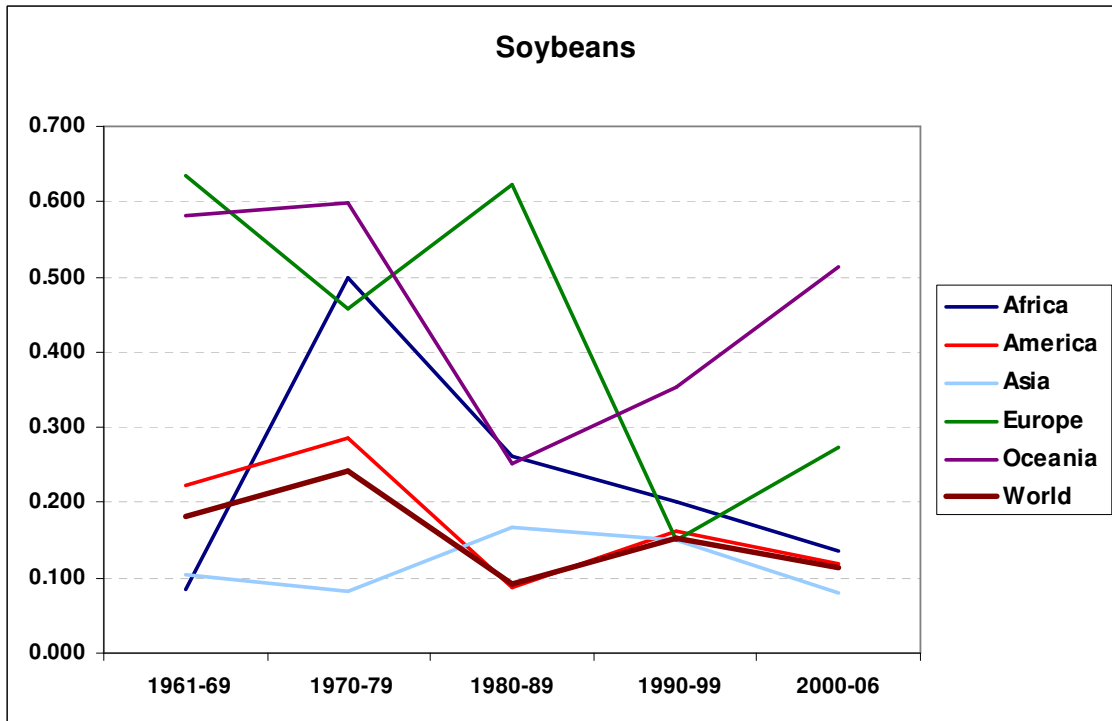
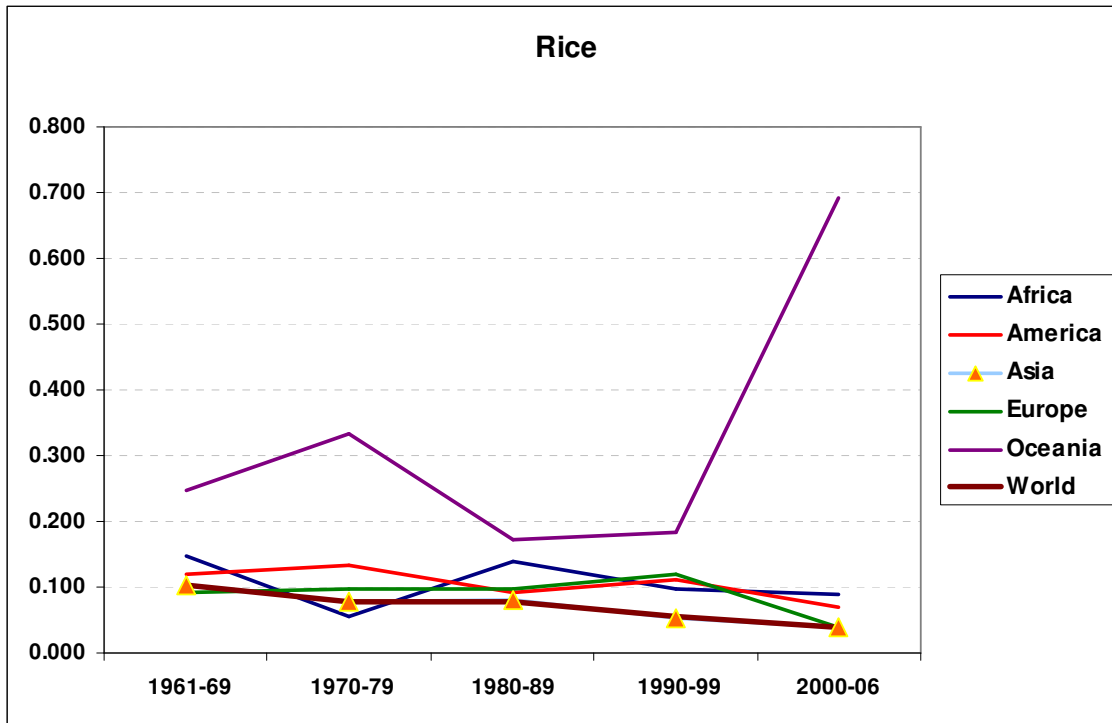
Source: FAO Trade and Markets Division and author's calculations

Figure 6: Coefficients of variation of regional and global production of major food commodities since 1961.



Sarris

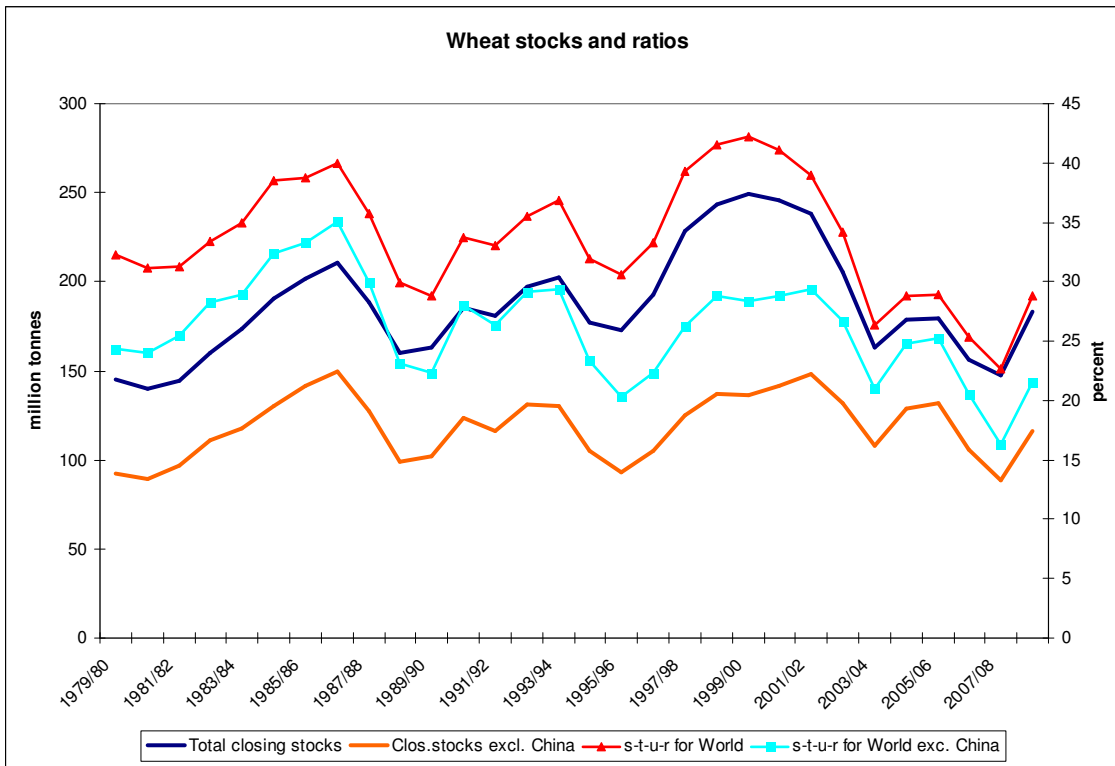
Figure 6 (continued)



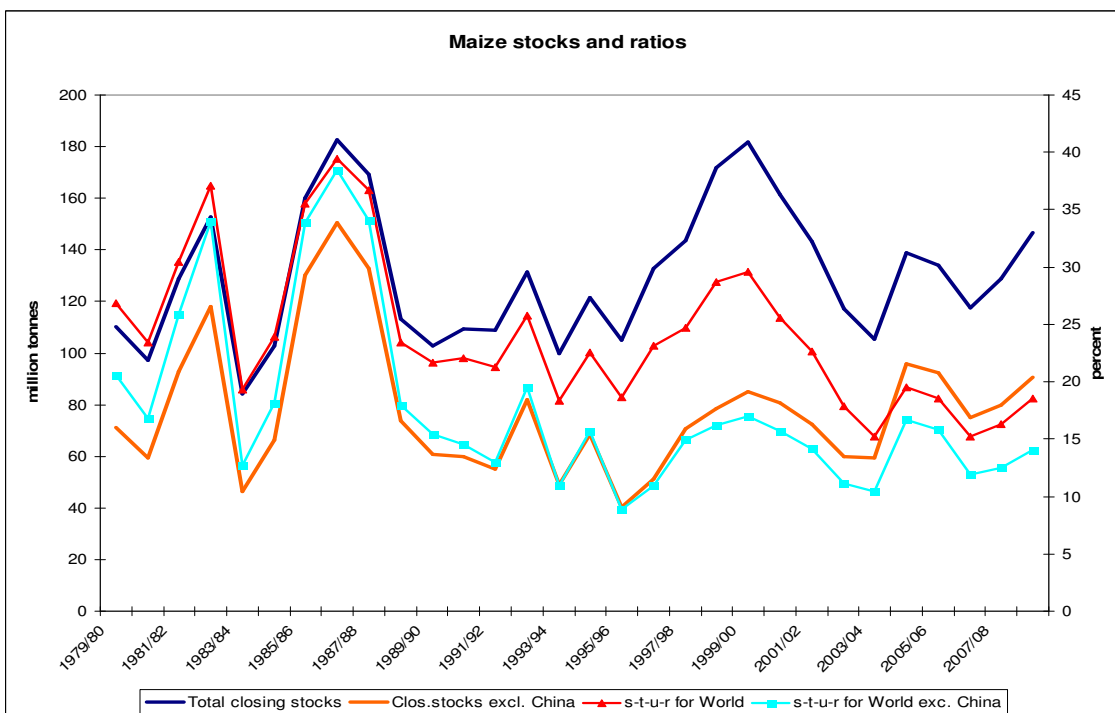
Source: Computed from FAO data

Figure 7: Global ending stocks of major cereals and stock to utilization ratios for the whole world and for the world without China

A. Wheat

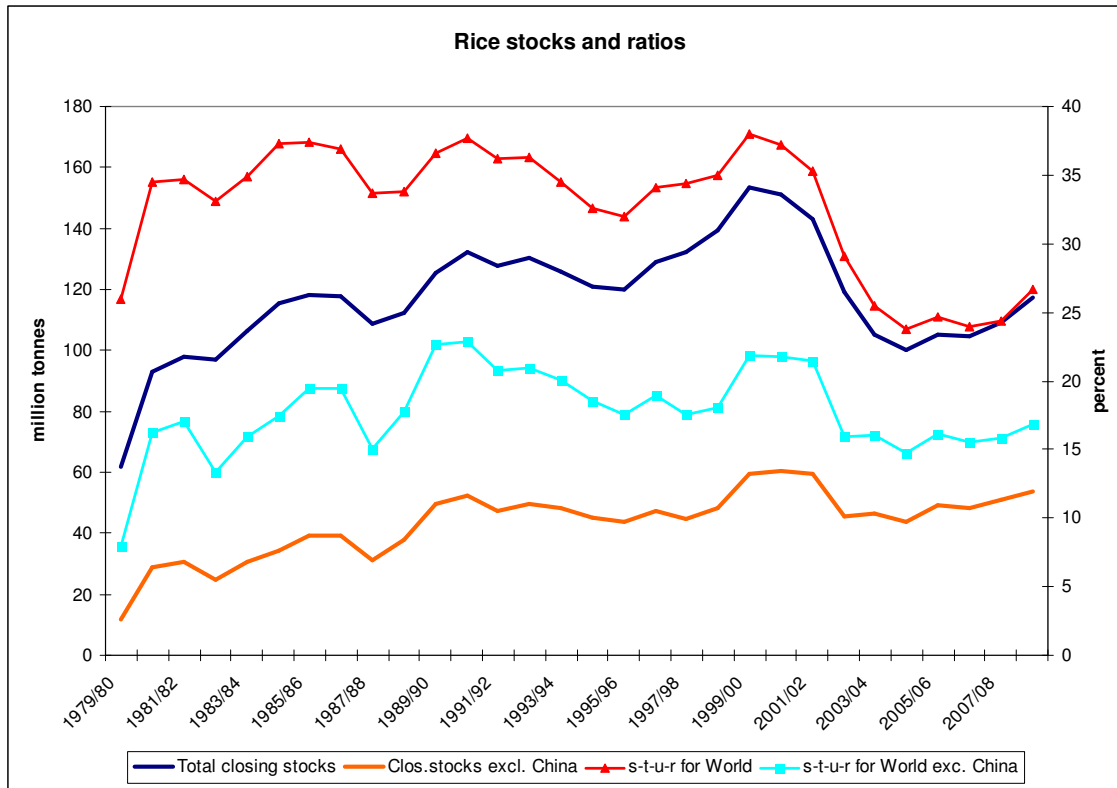


B. Maize



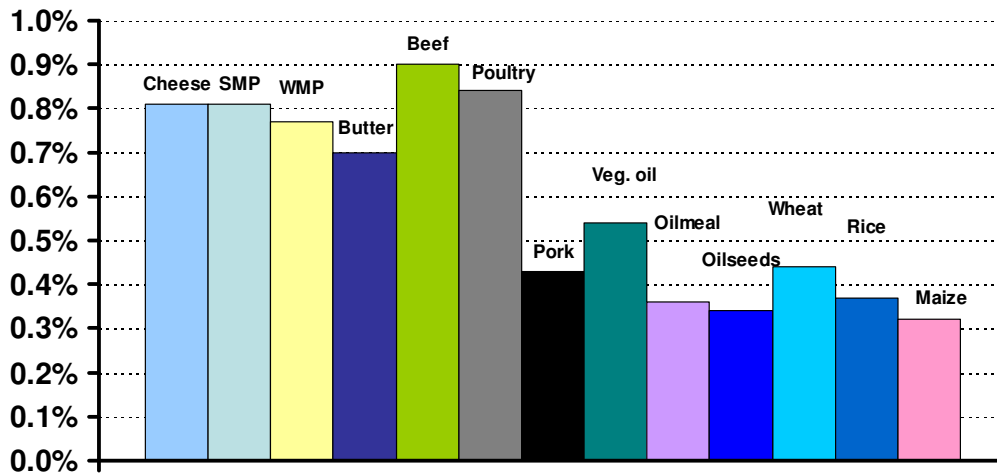
Sarris

Figure 7 (continued)



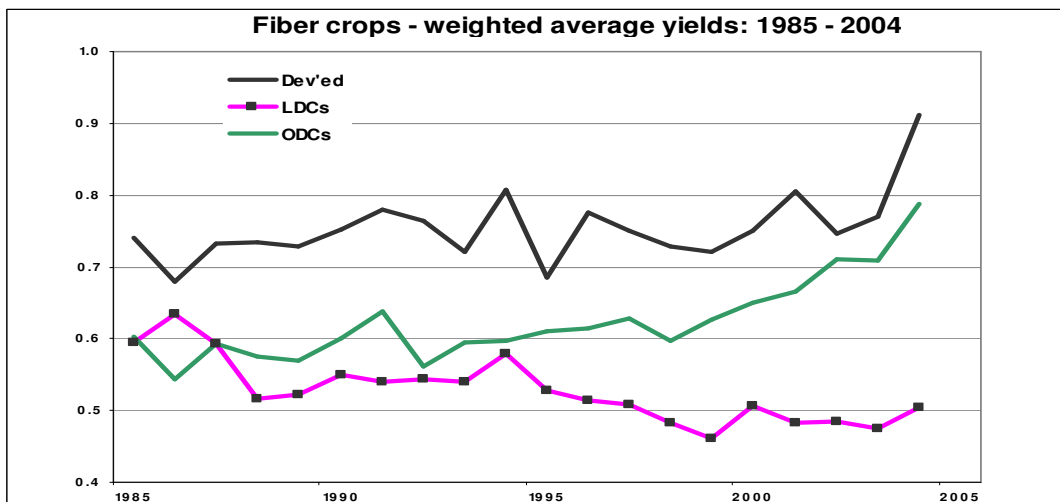
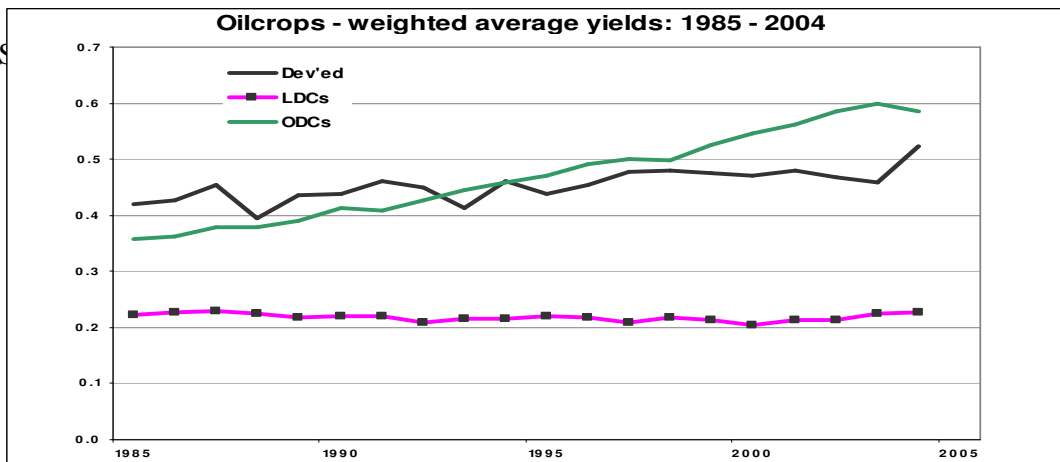
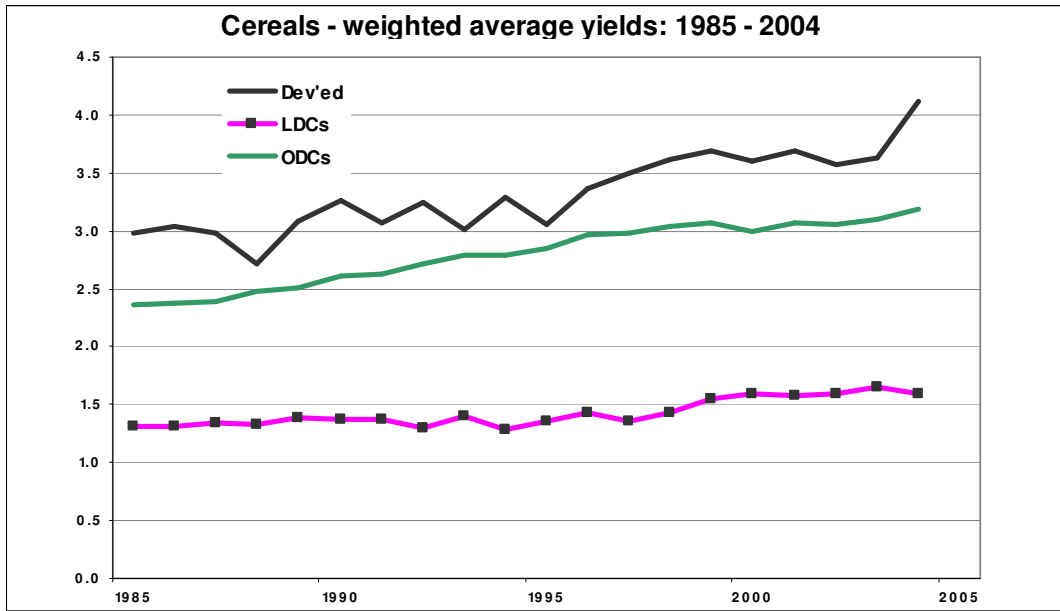
Source: FAO Trade and Markets Division

Figure 8 Impact of a one percent USD depreciation against all currencies on world agricultural commodity prices.



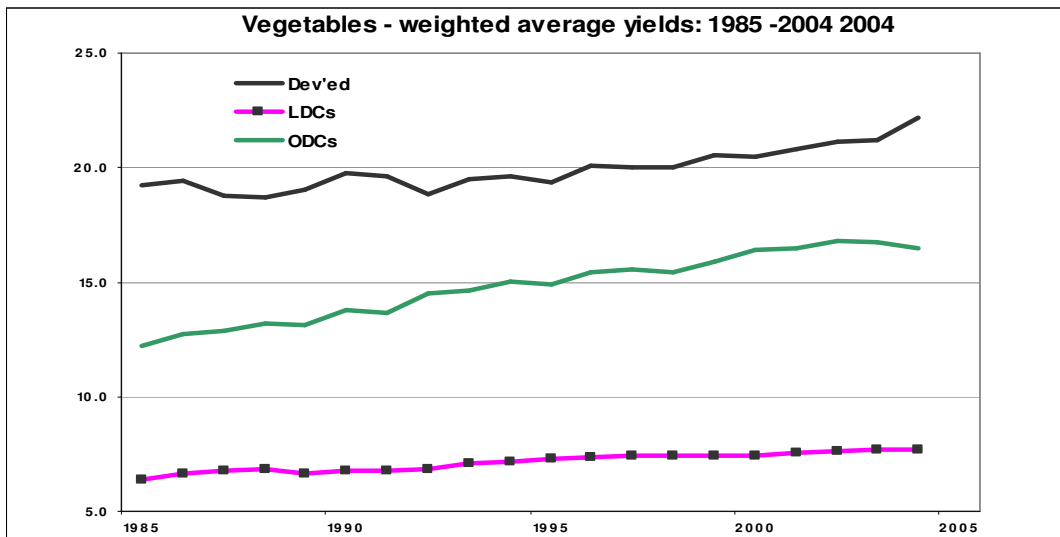
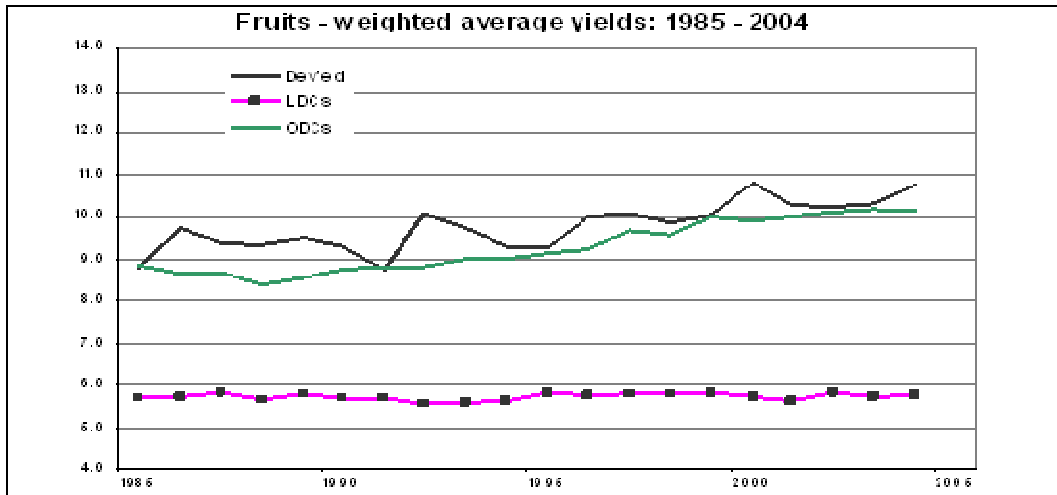
Source: FAO Trade and Markets Division

Figure 9: Average yields in developed, LDC and other developing countries, 1985-2004



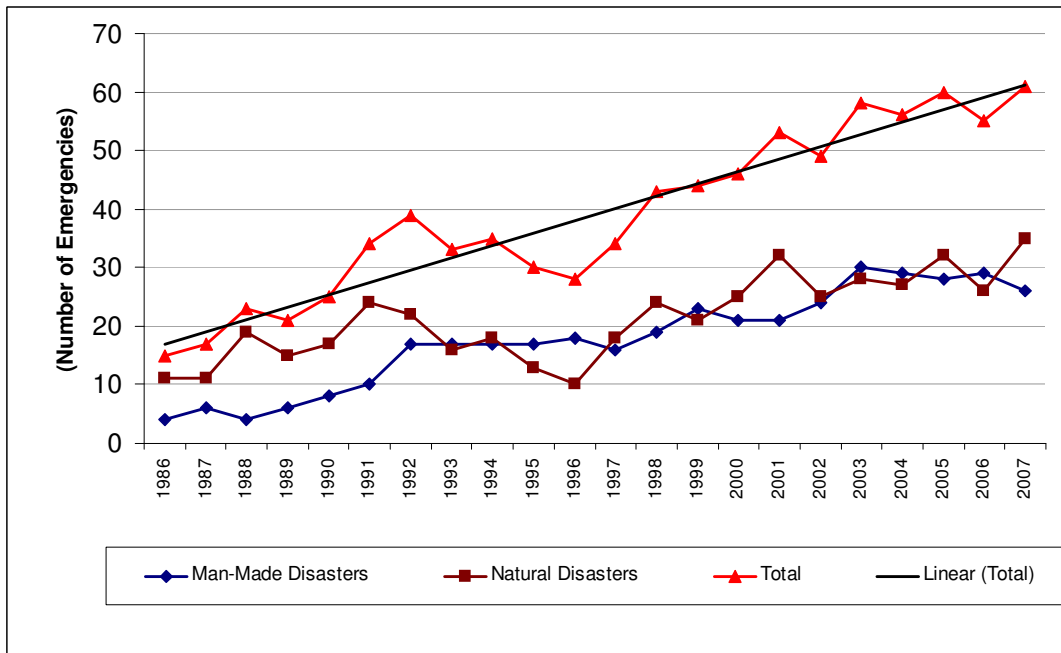
Sarris

Figure 9 (continued)



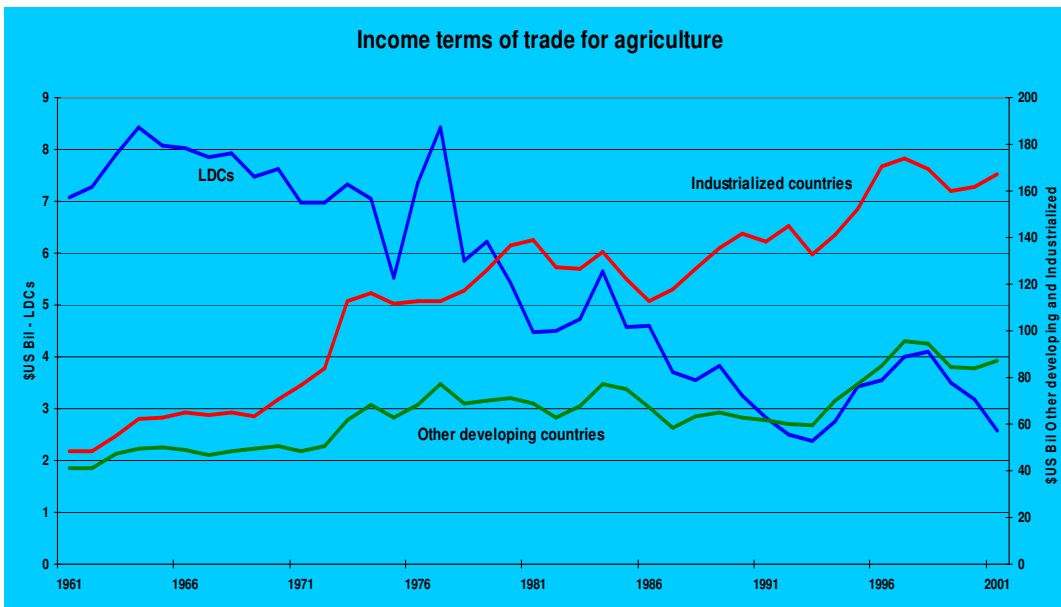
Source: Author's calculations from FAO data

Figure 10: Trends and causes of food emergencies



Source: FAO Global Information and Early Warning System (GIEWS)

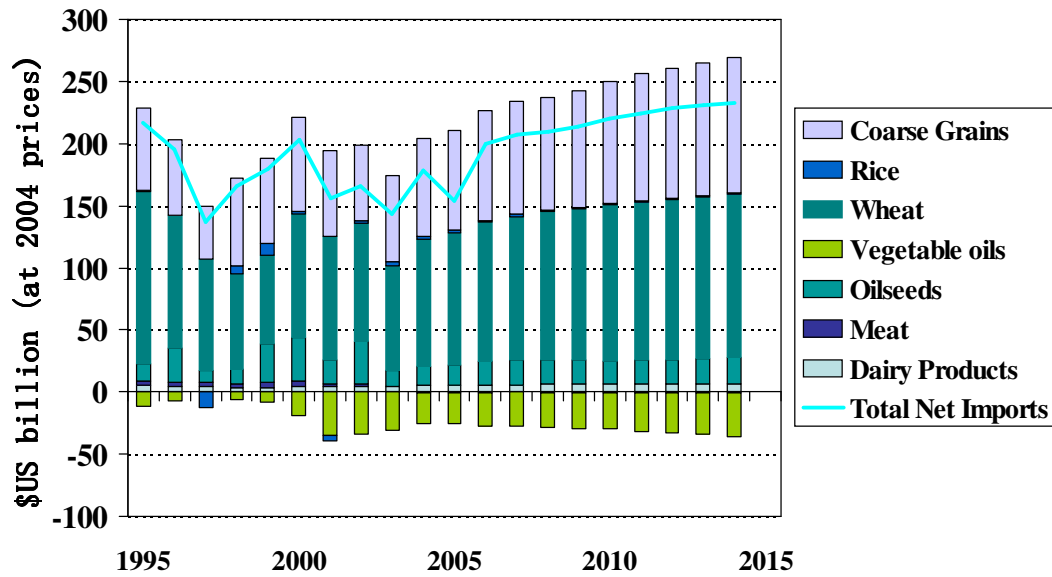
Figure 11: Income terms of trade for agriculture have deteriorated for LDCs during the last 40 years.



Source: FAO, State of Agricultural Commodity Markets 2004

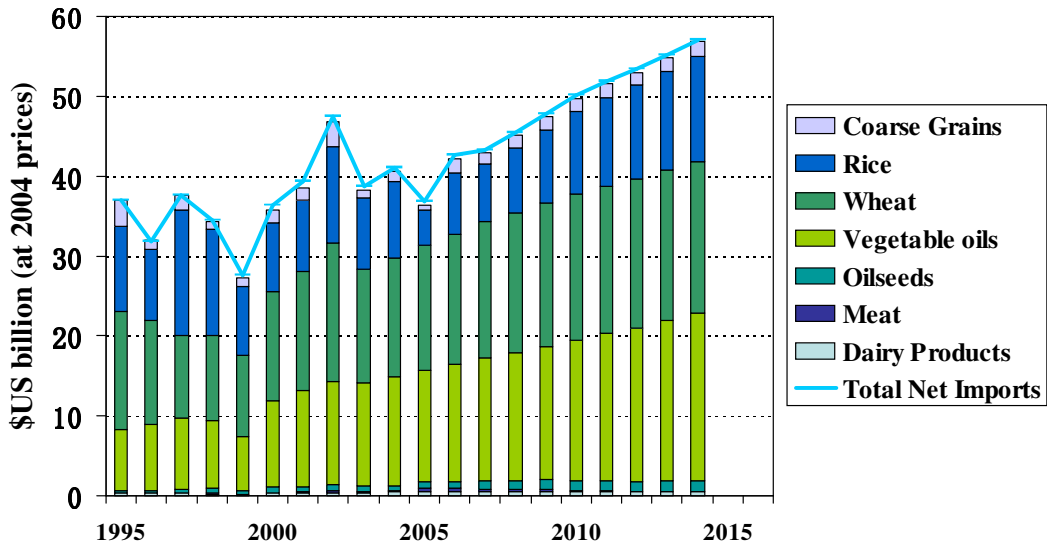
Sarris

Figure 12 Net imports of agricultural products by developing countries



Source: FAO Trade and Markets Division

Figure 13 Net imports of agricultural products by LDCs



Source: FAO Trade and Markets Division

Table 1 Average ad-valorem tariff equivalent in 2001 of imports of all agricultural products by country in column from exporting country in row

	USA	BRAZIL	EU25	CHI-IND	ROECD	LDCs	ODCs	ROW
USA	0.0	5.9	5.1	62.2	36.3	7.3	8.9	11.1
BRAZIL	5.6	0.0	3.5	95.8	99.3	8.5	9.8	29.7
EU25	1.8	7.3	0.9	22.1	16.3	9.5	12.8	16.3
CHI-IND	1.1	8.7	12.7	20.0	86.8	11.8	6.8	7.9
ROECD	0.2	5.5	3.2	20.3	32.1	8.2	5.5	11.2
LDCs	2.5	10.1	3.0	26.7	32.3	8.7	6.3	5.9
ODCs	1.4	1.5	12.3	53.4	20.1	10.3	9.1	16.7
ROW	6.3	10.3	2.9	14.6	10.0	3.0	16.3	4.5

Source: Morrison and Sarris (2006) based on GTAP database version 6 (Dec. 2004) In the tables ODCs refers to other developing countries, except Brazil, China, India and the LDCs

Table 2 Average ad-valorem tariff equivalent in 2001 of imports of all processed food products by country in column from exporting country in row

	USA	BRAZIL	EU25	CHI-IND	ROECD	LDCs	ODCs	ROW
USA	0.0	14.7	16.4	22.2	23.7	19.6	20.4	21.8
BRAZIL	8.9	0.0	34.4	37.2	21.3	19.1	9.1	25.5
EU25	3.8	16.4	1.3	30.7	27.6	25.6	16.5	19.7
CHI-IND	2.6	12.2	19.9	18.3	23.7	23.3	10.3	19.1
ROECD	2.3	16.5	14.2	20.4	35.2	20.3	14.0	21.9
LDCs	2.4	9.5	13.4	20.8	5.2	13.6	12.7	7.8
ODCs	3.9	3.1	18.6	44.8	18.7	26.6	12.8	26.2
ROW	2.5	5.8	9.8	17.0	9.0	15.2	21.6	6.3

Source: Morrison and Sarris (2006) based on GTAP database version 6 (Dec. 2004)

Table 3 Average ad-valorem tariff equivalent in 2001 of imports of non-food secondary and non-agricultural primary products by country in column from exporting country in row

	USA	BRAZIL	EU25	CHI-IND	ROECD	LDCs	ODCs	ROW
USA	0.0	9.9	1.9	12.3	1.1	12.2	5.0	3.7
BRAZIL	2.1	0.0	1.4	9.4	6.6	21.3	6.2	3.3
EU25	1.9	11.9	0.2	17.4	3.0	14.1	7.5	4.5
CHI-IND	3.8	11.5	3.6	19.4	5.0	19.5	6.3	12.0
ROECD	0.7	12.9	2.3	14.1	3.9	17.2	6.1	4.3
LDCs	3.2	0.3	0.3	4.5	2.6	6.9	2.7	3.9
ODCs	2.8	6.9	1.6	13.7	2.3	15.2	4.0	3.9
ROW	2.1	6.1	0.9	8.1	2.1	14.0	7.1	1.5

Source: Morrison and Sarris (2006) based on GTAP database version 6 (Dec. 2004)

Sarris

Table 4 Africa and dependence on agriculture

Share of Agriculture in GDP				
	1969-71	1979-81	1989-91	2002-04
North Africa	19.1	14.7	16.0	13.6
Sub-Saharan Africa: LDC	40.2	40.4	37.5	38.8
Sub-Saharan Africa: Other	30.6	27.6	27.1	26.6
Africa	31.9	29.6	28.7	28.4
Share of economically active population in agriculture in total economically active population				
	1969-71	1979-81	1989-91	2002-04
North Africa	0.54	0.43	0.30	0.23
Sub-Saharan Africa: LDC	0.83	0.79	0.76	0.71
Sub-Saharan Africa: Other	0.68	0.60	0.49	0.41
Africa	0.76	0.70	0.63	0.57

Source: Authors' calculations from FAO data

Table 5 Africa and agricultural exports

Share of agricultural exports in total exports of goods and services				
	1969-71	1979-81	1989-91	2002-04
North Africa	24.5	7.3	4.2	3.7
Sub-Saharan Africa: LDC	65.5	43.4	38.6	32.4
Sub-Saharan Africa: Other	37.4	25.5	20.7	23.5
Africa	46.8	29.6	25.1	23.4
Share of agricultural exports in total merchandise exports				
	1969-71	1979-81	1989-91	2002-04
North Africa	33.4	11.8	8.3	6.0
Sub-Saharan Africa: LDC	65.6	54.4	46.0	32.5
Sub-Saharan Africa: Other	52.1	34.2	26.2	19.3
Africa	58.8	44.7	36.9	26.3

Source: Authors' calculations from FAO data

Table 6 Developments in African agricultural import dependence 1970-2004

Share of agricultural imports in total imports of goods and services				
	1969-71	1979-81	1989-91	2002-04
North Africa	20.4	4.8	3.5	3.4
Sub-Saharan Africa: LDC	38.4	22.2	19.6	15.1
Sub-Saharan Africa: Other	33.5	20.9	21.4	15.9
Africa	33.3	18.5	17.3	13.2
Share of agricultural imports in total merchandise imports				
	1969-71	1979-81	1989-91	2002-04
North Africa	23.9	24.2	23.0	17.5
Sub-Saharan Africa: LDC	21.5	22.2	25.9	27.3
Sub-Saharan Africa: Other	17.4	14.8	14.2	18.1
Africa	20.6	20.3	22.4	23.7
Share of food imports in total exports of goods and services				
	1969-71	1979-81	1989-91	2002-04
North Africa	14.4	18.3	13.2	9.9
Sub-Saharan Africa: LDC	37.6	28.2	30.2	34.9
Sub-Saharan Africa: Other	14.1	8.7	6.8	11.1
Africa	24.1	18.8	17.9	20.9

Source: Authors' calculations from FAO data

Table 7 Evolving production structure in commodity dependent developing countries

	Ratio of the value of production of exportables to the total value of agricultural production (percent)			Ratio of the value of production of importables to the total value of agricultural production (percent)		
	1980-82	1989-91	2001-03	1980-82	1989-91	2001-03
Africa (24 cties)	23.1	22.1	21.8	24.7	25.7	25.0
Latin Am. Carib (11 cties)	48.1	52.8	48.0	45.0	43.8	41.8
Oceania (3 cties)	45.8	39.3	37.1	8.4	9.5	12.6

Source: Authors' calculations from FAO data