

Trade, Competition, and the Pricing of Commodities

Edited by
Simon J. Evenett and Frédéric Jenny



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Foreword

After several decades of quiescence, global commodity prices almost doubled in 2008 and, after a brief fall, rose again in 2011. Over the longer term, the impact of population growth on demand, and of climate change on supply, makes it likely that commodity prices will continue to be an important issue on the global policy agenda.

The 2008 spike in prices has been analysed exhaustively, and a range of causal factors have been identified – increases in demand from fast growing emerging markets; US subsidies, which shifted production toward biofuels and away from foodstuffs; liberalisation of global agricultural trade; and low levels of investment in agriculture. This short volume edited by Simon Evenett and Frédéric Jenny does not pursue this debate, but instead focuses on a different, and in many respects more interesting issue: the interplay between competition and public policy in these markets.

The discussion begins with a simple, but important observation – much of the attention and debate has focused on commodity prices, but what people care about are food prices. The two are not the same, for several reasons. First, the costs of agricultural commodity inputs make up only a fraction – usually 20% to 30% – of retail food prices, and so one would not necessarily expect them to move in tandem. But more important is the sequence of what Steve McCorriston, one of the contributors to this volume, calls ‘a complex sequence of successively oligopolistic markets’ that lie between the agricultural commodities traded on world markets and the retail prices of the foodstuffs these commodities are used to produce. It is this sequence of ‘vertically integrated’ markets, each of them far from the textbook model of perfect competition, that forms the heart of this eReport.

Departures from textbook models are likely to be of interest to the economists who teach from these textbooks. But the contributors to this eReport make a persuasive case that policymakers should sit up and pay attention as well. Competition matters, and the structure of these markets makes a profound difference to how we think about a whole range of issues, from the linkages between global commodity prices and domestic food prices, to the impact of agricultural trade liberalisation on local food prices and income distribution. The less competitive are these markets, the smaller is the fall in the domestic food price in response to a tariff cut, the smaller is the welfare gain for domestic consumers and the larger are the profits of domestic firms.

We are grateful to Simon Evenett and Frédéric Jenny for their hard work, first in bringing together the contributors to this volume, initially at the CEPR-CUTS Symposium on Trade and Competition Policy in Primary Product Markets held

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Publishing even a virtual eReport requires very real work, in this case by Anil Shamdasani and Samantha Reid in CEPR's Publications team. We are grateful to them once again for their characteristically swift and efficient work.

Stephen Yeo
CEO, Centre for Economic Policy Research
9 February 2012

1 Introduction

Simon J Evenett and Frédéric Jenny

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Having fluctuated in a relatively narrow band for almost 20 years, according to the UN Food and Agricultural Organisation, real food prices spiked in 2008 and in 2010–11 (FAO, 2011). These spikes were not expected and there are no guarantees that food prices will return to their previous plateau. In its latest report on *The State of Food Insecurity in the World*, the FAO estimated that just under 240 million persons were undernourished in Africa in 2008; the comparable number for Asia was just over 560 million persons (FAO, 2011: 8).

High food prices are not the only concern. According to the FAO, (2011) ‘Price volatility makes both smallholder farmers and poor consumers increasingly vulnerable to poverty,’ thereby compromising the ability of governments to reach one of the most important Millennium Development Goals. Policies were directly implicated in these developments. One of the FAO report’s ‘main messages’ was the following:

Small import-dependent countries, especially in Africa, were deeply affected by the food and economic crises. Some large countries were able to insulate their markets from the crisis through restrictive trade policies and protect their consumers through safety nets. However, trade insulation increased prices and volatility in international markets (FAO, 2011: 8).

The purpose of this volume, composed of papers presented at a conference co-organised by CEPR and CUTS in Geneva in September 2012, is to identify and assess the importance of the factors responsible for the recent increases in the levels and volatility of commodity prices. While many have stressed the consequences of export restrictions and the like on such prices, the approach taken here is broader. In addition to considering the impact of commercial policies (see the chapter by Hoekman and Martin), the impact of financial speculation and anticompetitive practices on commodity prices are examined (for the former see the chapter by Radetski; for the latter see the four chapters by McCorrison, Connor, Jenny, and Mehta et al).

Widening the scope beyond trade policy interventions is important because – to the extent that non-trade factors can be convincingly shown to have played an adverse role in raising the level and volatility of commodity prices – the design

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of policy responses at the national and international level ought to take account of all of the relevant causes. Moreover, in the case of financial speculation and anticompetitive practices there are few, if any, major international accords to limit the harm done by them – on commodity prices or other outcomes for that matter.

In principle, then, stabilising commodity prices may require developments in the international architecture of rules in a number of policy areas. Put another way, developments in recent years in commodity prices may well have revealed wide gaps in the rules governing the world economy. This volume will have served its purpose if it encourages greater consideration of these matters and the associated policy reforms.

Now it should be stated that no single volume is going to definitively settle these matters. Others will want to collect their own data, probe the evidence further, and carefully assess the national and international policy implications. This process of refinement and reconsideration is essential to proper policymaking. Still, it is our hope that this volume widens and deepens the debate on a matter of considerable significance to developing countries and to the vulnerable everywhere.

Reference

FAO (2011), *The State of Food Insecurity in the World*, Rome.

2 Commodity Prices, Government Policies and Competition

Steve McCorriston

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Introduction

Following the recent commodity price spikes of 2007–08 and the more recent rise in world commodity prices in early 2011 (the latter exceeding the peak of 2008), there has been much commentary and analysis on the causes and likely consequences associated with developments on world commodity markets. In turn, the extent of these price shocks gives rise to concerns for policymakers in both developed and developing countries alike, most obviously on how to protect the most vulnerable from food price rises, to the policy agenda incorporating risk management tools for producers, through to the macroeconomic policy implications as food price inflation outstrips general inflation across many countries. The policy focus is at both national and multilateral levels from, for example, the role of trade policy in insulating domestic markets from events on world markets and the appropriate response by national governments to commodity price surges, through to multilateral issues including the implications for trade negotiations and issues associated with the availability and coordination of commodity stocks. The recent G20 paper provides an overview of these issues (G20, 2011). With recent forecasts of commodity price developments over the next few years and the world population expected to reach 9 billion by 2050 (FAO, 2009a), the pressures on the global agriculture and food sector over the next few years are unlikely to diminish, particularly against the background of prolonged under-investment in agriculture (most notably in developing countries) and the possibility that the agricultural sector will be more susceptible to the vagaries of the environment.

The purpose of this chapter is not to provide an in-depth survey of these issues; rather, the intention is to outline some of the basic characteristics of agricultural commodity markets that provide an underpinning to understand recent developments on world markets. In doing so, however, we also aim to highlight issues where gaps in our knowledge exist and where research has been thin. Given the focus of this volume, many of these gaps will relate to competition issues and how they interact with trade issues in determining how

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we understand the structure of commodity and food markets and, in turn, the behaviour of commodity and food prices. We will argue throughout that, although the textbook treatment of commodity and food markets is that they are competitive, in reality this assumption is far from compelling. Concerns about competition in commodity and food markets stretch across advanced and developing economies, where departures from competitive market structures can involve private firms or state-sanctioned manipulation of market structure, where concerns about the absence of competition can range from local domestic markets through to competition in global supply chains, and where the vertically interlinked nature of commodity and food markets results in a complex sequence of successively oligopolistic markets.

Why does the link between competition in commodity and food markets matter? There are three broad answers to this. First, despite the understanding of commodity markets (we think) we have, there is less understanding about competition issues and how departures from competitive market structures impact on the behaviour of prices. Second, commodity prices and food prices are two different things. Raw commodities are inputs into the upstream segments of a chain of vertically related markets where any (or all) of the downstream stages in the food chain may be imperfectly competitive. Since consumers purchase a product (often highly processed, but sometimes not) from a retail sector, and both the processing and retailing sectors across many national markets have become increasingly concentrated in recent years, understanding how competition issues in vertically related markets impact on behaviour of prices at both ends of the food chain is of crucial importance in addressing commodity and food price issues. The third point is related to this: what implications do competition issues in food and agricultural markets give rise to in addressing policy issues? As we will show by way of example, departures from the perspective of competition raise concerns about the potential benefits from trade reform in agricultural markets, and also the likely behaviour of prices at different ends of the marketing chain. The chapter will address these issues.

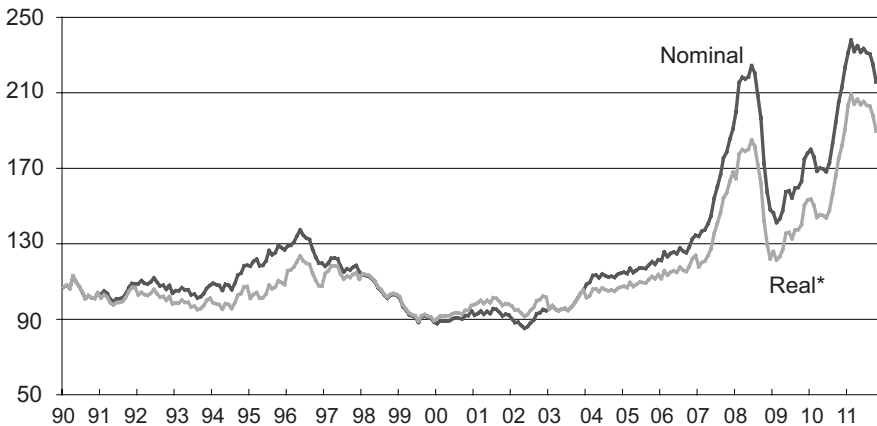
As a background piece to chapters presented throughout the rest of this volume, this chapter takes a broad sweep at a variety of issues rather than providing an in-depth discussion of any specific issue. The intention is to highlight what we know about the characteristics of commodity markets and what we know less about – particularly with respect to competition issues. The chapter is organised as follows. In Section 1, we provide a brief overview of recent events on world commodity markets, highlighting the issues that the recent literature has targeted. In Section 2, we outline the main characteristics of commodity markets and how they impact on the behaviour of commodity market prices. We also discuss briefly how these characteristics help us reflect on recent developments. In Section 3, we turn to trade policy issues and how policy potentially impacts on the structure of commodity markets. The observation that world commodity prices are not necessarily the variable of interest to domestic producers and consumers is made in Section 4. We turn more directly to competition issues in

Section 5, highlighting where competition concerns are likely to arise and, in Section 6, we discuss why they are likely to matter. In the context of this chapter, the discussion will necessarily be selective but hopefully serve to highlight why more attention should be paid to competition and market structure issues in commodity and food markets across a wide variety of settings. In the context of recent events, we also highlight issues that deserve further attention. We summarise and conclude in Section 7.

1 Recent developments in world commodity markets

Recent attention concerning commodity markets has centred on the commodity price spike of 2007–08. Against the background of relatively low prices over the 1990s and early 2000s, price pressures started to cumulate around 2005–08, leading to the commodity price spike of 2007–08. By late 2008, the prices for many staple commodities were more than double what they had been only a few years earlier. Figure 1 highlights these developments. Although in real terms the commodity price spike was lower than that of the commodity ‘crisis’ of the early 1970s (see below), the price surge was the most substantive witnessed for a considerable period of time.

Figure 1 Monthly food price index, 1990–2010



Source: FAO

There was, of course, much commentary on the causes of this commodity price spike and, since these have been covered elsewhere, there is no intention here to re-visit these issues in any depth¹. Broadly speaking, they can be grouped into three categories: demand factors (macroeconomic developments including strong economic growth in emerging economies), supply factors (including supply

¹ Examples include Abbott *et al* (2009), Baffes and Haniotis (2010), Heady and Fan (2008), Wright (2011) and Trostle *et al* (2011).

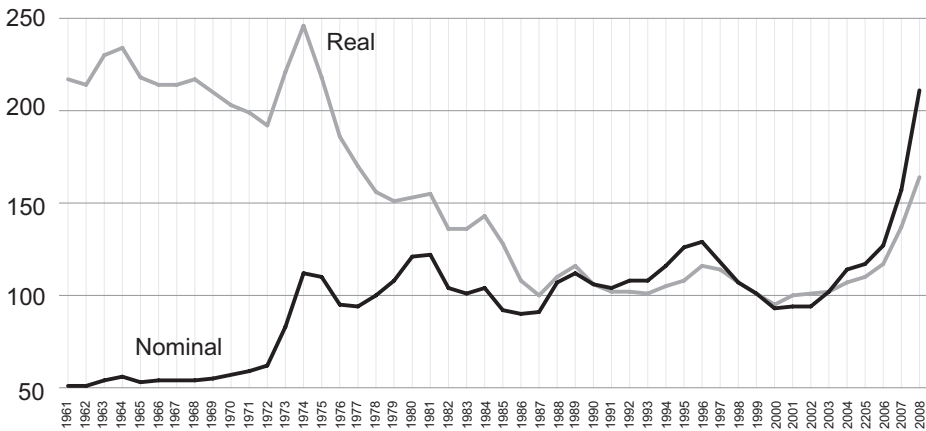
shortfalls due to weather and low stock availability) and policy factors (as some countries responded to the price surge by reducing applied tariffs or imposing export bans). Many of these factors are known to influence world commodity prices, but there were perhaps several features of the late 2000s that caused these events to be distinctive. First, while it is well-known that macro factors, weather fluctuations and government policies can influence world market prices, in the latter half of the decade the coincidence of these events created a 'near perfect storm' (Headey and Fan, 2008), particularly against the background of low stocks (see also below). Second, the impact of land resources being diverted to non-fuel uses, reflecting in large part US government mandates and high oil prices, had a significant impact on world market prices and has led to a 'structural' change in world agricultural markets. Biofuels will continue to impact on world prices, with just under 40% of US corn now being diverted to fuel rather than food purposes. Third, against the background of the financial crisis, there was the increased 'financialisation' of commodity markets; though there is much dispute about the contribution of non-commercial activity on commodity futures markets, the role of 'speculation' nevertheless attracted the attention of politicians. There was indeed a substantive increase in commodity index funds holding long positions in commodity – Irwin and Sanders (2011) estimate index fund positions to have increased by around US\$200 billion between 2004 and early 2008, increasing again after a short-lived dip to over US\$300 billion in early 2010. However, despite the flow of non-commercial investment into commodity futures markets, there is limited evidence that speculation was one of the main driving forces of the recent spikes in world commodity markets, as opposed to fundamental factors. Irwin and Sanders (2011) review the evidence surrounding the recent concerns about 'financialisation'.

Although world commodity prices fell back from their 2008 peak (see Figure 1), world prices rose sharply again in early 2011. Supply shortfalls, government policies, strong demand and continued low stocks contributed to price pressures. Indeed, despite the recent focus on the events around 2007–08, the more recent price spike of 2011 exceeds that for a number of agricultural commodities. This is shown clearly in Figure 1. However, taken over a longer-term perspective, the recent commodity price spikes are lower, in real terms, than the peak experienced in the 'commodity crisis' of 1973–74. This is shown in Figure 2, which presents commodity prices from the early 1960s. Note that the commodity crisis of 1973–74 came against the background of relatively low prices over the 1960s. This background of low real commodity prices for a number of preceding years was also present for the commodity price spike of 2007–08.

Commodity price spikes clearly have an immediate impact on the poorest and most vulnerable – between 2004 and 2009, undernourishment around the world increased by around 16%, from 872 million to 1,017 million, with the most substantive increases in world hunger being in Asia and sub-Saharan Africa (FAO, 2009b). Although commodity price spikes, by their very nature, will fall back, recent forecasts of commodity prices over the next decade or so predict continued

pressure on prices such that we should not expect a return to the low prices of the 1990s and early 2000s. Prolonged low investment in agriculture, the need to restore stocks and continued strong demand from emerging economies, as well as growth in the world population, will result in higher prices, on average, than we have been used to over the past two decades (OECD-FAO, 2011). Clearly, given the importance of commodity prices, a better understanding of how commodity markets work and the identification of what we need to know is necessary at the present time.

Figure 2 Real and nominal food price index, 1961–2008



Source: IMF

2 The underlying characteristics of commodity markets

A simple textbook characterisation of a commodity market would have current demand and supply being equal, with changes in prices being due to one or both of these curves shifting in any given period. In large part, we know that several factors can be responsible for shifting either of these curves: macroeconomic factors such as economic growth and exchange rates, vagaries in the weather or political factors that may disrupt production from key supplying countries, and so on. Yet, commodity prices do exhibit particular characteristics: they may exhibit co-movement (due to high substitution elasticities), they tend to exhibit more variance than prices in other markets, and commodity prices can be characterised by long periods in the doldrums interrupted by occasional price spikes. Therefore, to fully understand how the underlying characteristics of commodity markets impact on price developments (over both the short and long run), we need to delve a bit deeper than the textbook example. In this section, we focus on long-run trends in commodity prices, commodity price volatility and the potential for occasional but ‘short-lived’ price spikes (a related, but nevertheless distinct, phenomenon).

2.1 Long-run trends in commodity prices

Relative to the price of manufactured goods, it is hypothesised that, over the long run, commodity prices will have a secular tendency to decline. This is the well-known Prebisch-Singer hypothesis². The main factor driving this underlying trend is differences in the income elasticities of demand for primary commodity and manufactured goods. To understand this hypothesis of how declining real trends in commodity prices materialise, suppose we have two sectors – agriculture and manufacturing. Assume also, for the sake of argument, that due to changes in technology or productivity improvements, the supply curve in each sector shifts to the right over time and, for the sake of this particular example, that these supply changes are no different across the two sectors. With the supply curve in each sector shifting to the right, what happens to the trend in the prices for agricultural and manufactured goods depends on how the demand curve shifts. With the income demand elasticities being different across these two sectors, the underlying trend will also differ. Specifically, the income elasticity of demand is lower for agricultural commodities than it is for manufactured goods. As incomes grow, the demand for food grows, but at a less than proportionate rate. If the income demand elasticity for manufactured goods is higher than that for primary commodities, this will mean that, over time, the price of primary commodities relative to the price for manufactured goods will therefore decline. A further potential cause of the declining terms of trade relates to differences in the structural characteristics of manufacturing and agricultural markets. Given that the former are more likely to be characterised by market imperfections (eg the existence of trade unions, market power, *etc*), the benefits of productivity increases will be captured by trade unions/firms, hence keeping prices high. In agricultural markets, which are competitive, the productivity increases will be reflected in price declines. This could also lead to a relative decline in commodity prices over time.

Prebisch, who was the first secretary-general for UNCTAD in the early 1950s, saw this as a particular issue for developing countries whose economies tend(ed) to rely on primary commodity exports. With this fundamental difference between the income demand elasticities, their terms of trade would see a secular decline with the resulting macroeconomic problems that would result (for example, balance-of-payments problems). As such, it could be a possible reason to promote diversification through import substitution policies. Although many developing countries have reduced their reliance on primary commodity exports since the 1950s, the principal mechanism that underpins the Prebisch-Singer hypothesis suggests that relative commodity prices would decline over the long run³.

The conjecture that income elasticities differ is perhaps not surprising. Engel's law suggests that demand for food will not increase at the same rate as income

² See Prebisch (1950) and Singer (1950) for the original expositions of this.

³ An alternative explanation is that there is no trend (at least for some commodities) where commodity prices are bound by low real wages in developing countries (see Deaton, 1999).

growth. Cross-sectional evidence would also support the expectation that the poor spend a larger proportion of their income on food than the rich. Moreover, estimates of income elasticities of demand also confirm this underlying feature of the demand for food. Take some recent estimates from the US Department of Agriculture to highlight this – in the US, the income elasticity for food is around 0.34%. This compares with income elasticities for clothing and footwear of 0.96%, and for transport and communication of 1.13%. These differences across sectors hold for all 144 countries for which the US Department of Agriculture provides evidence, including developing countries. In Ethiopia, for example, the income elasticity for food is 0.83%, while for clothing and footwear, and transport and communication, it is 0.97% and 1.27%, respectively. In summary, these differences in income demand elasticities across sectors would, in the Prebisch-Singer view of the world, result in a long-run decline in the relative prices of primary commodities.

2.2 Commodity price volatility

In our simple textbook example, changes in either supply or demand will cause prices to change. This, in itself, is a good thing as the change in price clears the market and sends the appropriate signals to producers and consumers. However, one of the concerns of primary commodity markets is that prices are ‘volatile’, *ie* prices change ‘too’ frequently and the amplitude of these changes (both up and down) is ‘too’ high, and that this causes problems for producers and consumers in coping with the changes, and problems for governments in managing the outcomes of these changes. Moreover, the nature of price volatility, if not adequately dealt with, results in lower investment and greater insecurity compared with an environment with more stable prices. Note that in characterising the issue of price volatility in agricultural markets, we are distinguishing between fluctuations around an underlying trend and the existence of price spikes, which we deal with below.

As with the long-run terms-of-trade issue, the underlying characteristics of commodity markets give rise to particular features of commodity price behaviour. First, price demand elasticities are low for food and agricultural products, and are lower compared with those for other sectors of the economy. To take the same examples as above, in the US, the price demand elasticity for food is around -0.25%, compared with -0.71% and -0.83% for clothing and footwear, and transportation and communication, respectively. These price elasticities are, of course, not unrelated to the proportion of income spent on food, but even among poor consumers, price elasticities for food and agricultural markets are relatively low. In Ethiopia, the price elasticity for food is -0.61% (compared with -0.71% and 0.93% for clothing and transportation, respectively).

Supply elasticities also tend to be low, though here it is important to differentiate between the short and the long run. In any given year, the availability of supply

may be given as it takes time for production to materialise over the production cycle. As a consequence, supply tends to be inelastic in the short run though, with producers able to increase supply over time, supply tends to be more elastic over the longer run.

The consequences of low demand and supply elasticities mean that, for any given shock to either the demand or supply side, the extent of price changes will be more substantive compared with markets where the price elasticities are higher. Taken over time, we would expect price volatility to be higher in commodity markets compared with markets where demand and supply responses are more elastic.

2.3 Commodity price spikes

Although the above characterisation implies a single-period framework (with supply equalling demand at any point in time), this is not a full picture of a commodity market. Commodities can be stored, and it is this storage feature of commodity markets which leads to a more accurate characterisation of commodity price behaviour. Specifically, with the prospect of storage, inter-temporal arbitrage becomes an important feature of commodity markets⁴. If expected prices are anticipated to be higher in the next period compared with the current period (and exceed the marginal cost of storage, which can assumed to be low), then there will be an incentive to store the commodity. Similarly, with expected prices lower than the current period, there will be no incentive to store the commodity. The potential effect this has on commodity price behaviour is captured in Figure 3.

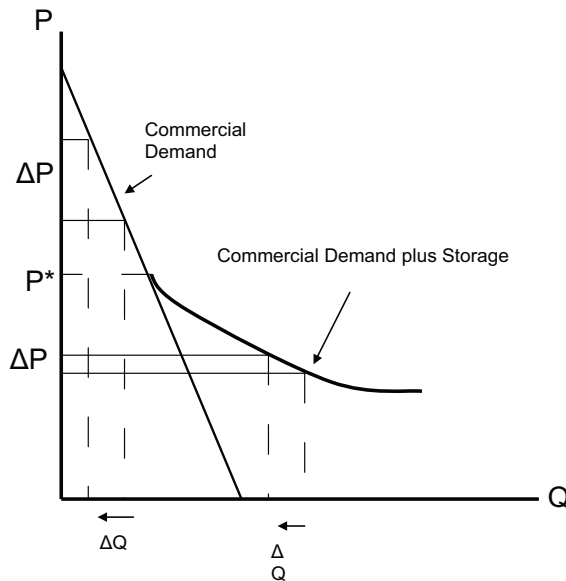
The key effect of inter-temporal storage is to kink the demand curve below a certain price, p^* . Below this price, current prices are relatively low and stocks of the commodity are high. Above this price, the demand curve is steeper, current prices are relatively high and stocks are low. What would happen, then, if there were to be a negative supply shock? If you are on the flatter section of the demand curve, stocks can be released which aids the overall responsiveness to the decrease in supply. Commodity prices will rise, but the response is relatively elastic. However, if we are in the steeper segment of the demand curve where there are no stocks, then a negative supply shock will cause a greater change in the market price and price spikes can arise.

Although the storage model is fairly simple to explain, it nevertheless highlights important aspects of commodity price behaviour. The headline that arises from this model is that the demand function is *non-linear* which, in turn, underpins how we understand price behaviour. There are several aspects to this. First, the volatility of commodity prices can vary over time; variation in commodity prices will depend upon which section of the demand schedule we are on. Second,

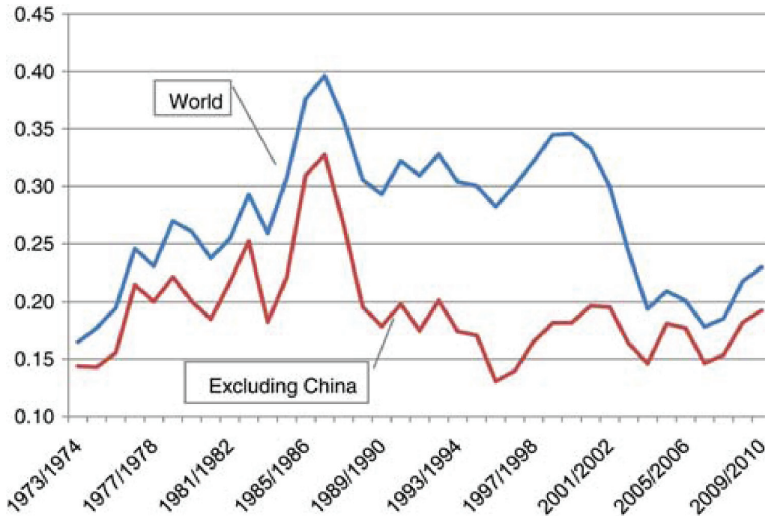
⁴ For an extensive treatment of this issue, see Williams and Wright (1991).

there is the possibility of stock-outs and, in turn, a price spike. Note that the volatility issue is a different concept from the price spike. Third, commodity prices may, over time, exhibit a pattern associated with prices being low and relatively stable for periods, coupled with (short-lived) periods of high volatility and price spikes. In other words, price behaviour should be asymmetric. These features of commodity markets should be reflected in a variety of statistical measures including auto-correlation (prices should be related over time), positive skewness (capturing price spikes) and excess kurtosis (where the distribution of prices is relatively flat).

Figure 3 Commercial demand and storage



Perhaps more fundamentally, it implies that we have to think differently about the underlying characteristics of commodity markets. Commodity markets will always be hit by shocks to demand and supply, whether it be the weather affecting supply, macroeconomic factors such as exchange rates or strong underlying growth, or changes in government policies. But the impact on world prices will depend on the underlying availability of stocks and there is, therefore, an important inter-temporal aspect to understanding commodity markets and associated commodity price behaviour. In this context, Figure 4 reports the underlying availability of wheat stocks over the 1973–2010 period. As can be seen from the figure, towards the latter half of the 2000s, stocks were relatively low such that when the shocks hit, the ability to respond was considerably weaker than it would have been at other times.

Figure 4 Ending stocks of calories from major grains

Source: Wright (2011)

2.4 Evidence

The question of how well these underlying characterisations of commodity markets fit with empirical observation has generated considerable activity among applied economists, and this is not the occasion to report on this matter extensively. Rather, a few observations will be made. First, with regard to the Prebisch-Singer hypothesis, the task for the econometrician is to detect the underlying long-run relative trend in the presence of occasional structural breaks. These may be associated with war or commodity crises, but having accounted for these structural breaks, does the underlying secular decline in the commodity terms of trade for primary commodities still exist? An extensive number of empirical studies exist on this issue, including Cuddington and Urzua (1989), Powell (1991) and Kellard and Wohar (2006), among others. A recent study (Harvey *et al*, forthcoming) confirms the likelihood of relative decline. Using four centuries' worth of price data, 11 of the 25 commodity groups they study exhibited a long-run decline while the remainder exhibited no positive trends over the long run.

Second, the commodity price model with storage, while intuitively appealing, has been more difficult to reconcile with the data. Deaton and Laroque (1992, 1996) have noted this difficulty, while even simple measures do not provide unambiguous support for the underlying statistical properties of commodity price behaviour. More recently, however, Cafiero *et al*. (forthcoming) have found more promising results that the basic commodity model with storage is a consistent representation of commodity price behaviour.

Finally, what is the evidence on commodity price volatility? As noted above, commodity prices are known to be volatile, but with recent events on world markets and the attention of policy makers centred on coping with price volatility, a more precise question to ask is whether commodity price volatility has increased. The evidence to date suggests that, while commodity prices do exhibit volatility, volatility has not necessarily increased when taking a longer-run perspective. Barrett and Bellemare (2011) present evidence to make this point clearly; Balcombe (2011) also presents more formal econometric evidence of this. The main point is that it is important for policymakers to separate the spikes from volatility, as they imply different policy responses. This, of course, is not to say that price volatility is not an issue and that policy measures are not required, but the recent impact arising from world commodity markets on consumers and producers around the world comes from high, but not necessarily more volatile, prices (taken over a medium- to long-term perspective).

3 Government policies and world commodity markets

Perhaps one of the most enduring features of the global food and agricultural sector is the extent of government intervention that characterises most developed and developing countries. The recent World Bank project (Anderson, 2009) gives an indication of the pervasiveness of government intervention around the world. The reasons for government intervention are varied but, referring to the discussion above, the potential for declining producer incomes, coupled with the vagaries associated with price volatility, give two immediate possible reasons for intervention. More generally, governments have found it necessary/desirable to intervene to promote food security, to increase production and support farm incomes, and, in some countries, to ensure low prices for consumers. They have done so using a wide variety of measures.

The most obvious outcome from government intervention is that the price that matters most to farmers and consumers in any country is not necessarily the price on world markets, but the price that is influenced (or, in some cases, determined) by government intervention in the domestic market. These domestic prices are influenced by domestic price support policies, stabilisation schemes, food subsidies to consumers, and so on, such that the prices that consumers, producers, and indeed the food industry, respond to may bear little resemblance to the prices observed on world markets. However, this delinking of what happens on world markets from what happens on domestic markets does not imply that world market and domestic prices are unrelated; they are, and the relationship is two-way. Moreover, where government policies have cut the link between world and domestic markets, there is still a price to pay for this intervention. For a commodity-importing country, keeping domestic prices low when world prices are high can involve substantive costs to the exchequer. For an exporting country, when world prices are low but domestic prices are high,

this can involve significant costs as the government is required to purchase the commodity to sustain the domestic price and either keep it in storage or sell it on world markets with the aid of export subsidies.

However, government intervention also impacts on world prices and there are several mechanisms whereby these effects arise. First, and most obviously, direct intervention in trade affects the level of world prices. The use of export subsidies lowers world prices; this was a common criticism of the EU's Common Agricultural Policy. Similarly, export bans or export taxes fuel price increases on world markets. The recent actions by Argentina, India and Russia are examples of this. In importing countries, raising import duties which serves to support high domestic prices has the effect of reducing world market prices; reducing applied tariffs when world prices are high fuels an increase. In sum, government policies that cause domestic prices to go in one direction create an externality on world markets – world prices tend to go in the other direction. Moreover, while government policies impact on the level of world market prices, they also have a tendency to increase their volatility. While this effect has been documented in academic research, is not often highlighted. Specifically, through either an explicit policy initiative such as an export ban or, more subtly, through a particular instrument such as a variable import levy or variable export subsidy, the world import demand or world export supply schedules will become more inelastic. In that context, not only is the world market 'thinner' as a result of government policies around the world, but the underlying volatility of world market prices will also have increased. In other words, for any given shock that would hit the world market, the proportionate change in world prices is greater in the presence of nationalistic policies. Specifically, world prices are more volatile while domestic prices are more stable.

This issue has long been recognised and identified as contributing to the commodity crisis in 1972–74 (see Johnson, 1975). More recently, Martin and Anderson (2011) have explored the effect of export restrictions on commodity price booms, and estimate that around 45% of the increases in rice prices in 2006–08 may be due to market insulation policies, with the comparable estimate for world wheat prices being around 30%.

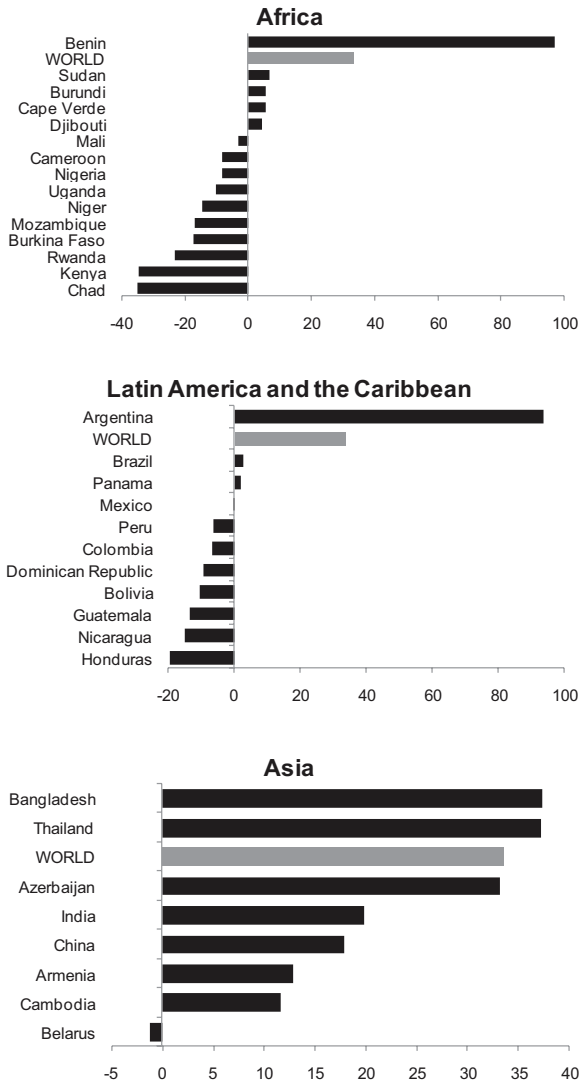
In sum, government policies aimed at meeting domestic objectives imposes an externality on world markets and, in turn, on trading partners. This has been largely the issue that has occupied the WTO in dealing with the agricultural aspect of the trade negotiations and why, for such a long period of time, it was even difficult for agriculture to be included in the trade-negotiating architecture. This will continue to be a challenge and, while economists can advise on the benefits of freer trade and reduced government intervention as means to support food security, the danger is that recent events will have turned governments inward and that the benefits of reducing government intervention will be foregone.

4 World versus domestic food prices

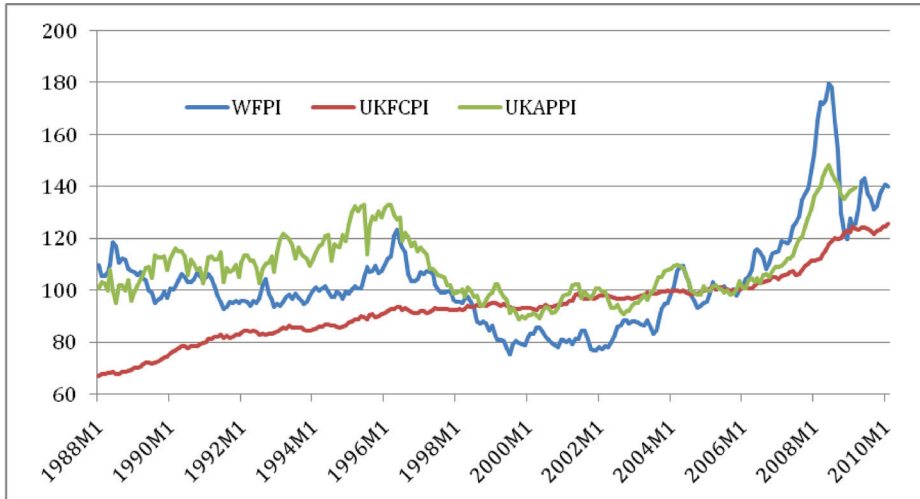
Much of the discussion of recent developments on commodity markets has focused on world prices, yet the prices that matter to most farmers and consumers are domestic prices and these can be quite different to what happens on world markets. The pervasiveness of government policies around the world, coupled with other factors that relate to market integration (eg infrastructure, changes in exchange rates, *etc*), suggests that the link between world market prices and domestic prices may be weak. Perhaps the most obvious indicator of the relatively weak link between world and domestic market prices is the extent of price transmission, and Figure 5 gives some indication of price transmission across a selection of developing countries. As is evident from the figure, the responsiveness of domestic prices can often be relatively weak. This price transmission effect appears to be strong in Asia but is considerably weaker over a wide range of other developing countries.

A further notable aspect to this link between domestic and world prices is that, for many consumers around the world, what they buy in the food retailing sector has passed through several stages of a vertically linked food chain. Even where the food commodity is relatively unprocessed (eg, bags of rice sold in developed country supermarkets), there are still a range of market participants involved in procuring the raw commodity and passing it through the vertically related food sector until it is stocked on the supermarket shelf. The main point to be made here is that the raw commodity traded on world markets serves as an input into the food sector which is combined with other inputs and passed through a vertically linked food sector before reaching consumers. The raw commodity share of final food prices can be relatively low and, in most developed countries, the raw agricultural commodity accounts for around 20-30% of the final good price. Figure 6 gives a useful insight into the behaviour of retail food prices compared with domestic producer and world food prices over time, the example here being the UK. The figure shows that world market prices behaved significantly differently from domestic retail prices (although there appears to have been a stronger relationship between world and domestic producer prices). Domestic retail food prices appear to have been much more stable than those we observe on world markets, but the important observation is that they are very different.

Figure 5 World and domestic prices for selected developing countries



Source: IMF.

Figure 6 World and UK domestic producer prices and retail food prices, 1998-2010.

Source: Davidson *et al* (2011).

There are perhaps three implications that arise from the observation that world market prices are not synonymous with domestic retail prices. First, what happens on world markets still matters. Food price inflation has been increasing across many countries and has been leading core inflation, thus making it an issue for macroeconomic policy. This holds for both developed and developing countries. Second, what happens between the raw commodity stage and the final retail stage also matters for domestic producers and consumers; even when the raw commodity is exported, understanding the vertically linked global food chain is crucial for understanding the determination of prices and the corresponding characteristics at both ends of the vertically related chain. Third, although not the only means through which concerns about competition can arise, addressing competition issues in the context of the food chain is an important consideration in understanding how commodity and food markets function.

5 Competition issues in agricultural and food markets

Competition issues in agricultural and food markets arise in a number of contexts covering local/regional, national and international markets, and across developed and developing countries. The issues affect both the import and export side of markets, and impact on consumers, farmers, firms and intermediaries involved in the production, procurement, processing, distribution and retailing of food and agricultural commodities. The absence of competition may be directly related to trade or principally domestic in nature, and can involve private firms or state-sanctioned enterprises. Concerns about abuse of market power may be associated with highly concentrated markets, buyer or seller power, and may stretch to cartels (state-sanctioned or private). In some cases, concerns about market power may

relate to space; in developing countries, there can be concerns with the exercise of market power in local and regional markets due to poor communication or weak infrastructure. In this section, we provide some examples that highlight potential competition concerns in agricultural and food markets. In the following section, we ask the more important question: Why does the absence of competition matter for addressing the issues covered in previous sections, specifically the behaviour of commodity and food prices and trade policy issues?

Given the range of potential competition issues that may arise in commodity and food markets, we confine the discussion here to two aspects – first, state manipulation of market structure; and, second, market structure in vertically related markets.

5.1 State manipulation of markets

As noted above, one of the main features of agricultural commodity markets has been extensive government intervention. While the discussion and assessment of government policies has largely concerned price support policies, subsidies of various forms, and the wide range of non-tariff as well as tariff measures that apply to imports and exports, governments have also directed manipulated market structure to meet policy aims. There are several examples of this.

One notable example has been inter-governmental agreements in the form of international commodity agreements, which have existed in important commodity markets including coffee, cocoa and sugar, among others. These commodity agreements have involved the coordination of stocks (buying and selling) and the use of export quotas to determine the amount of the commodity sold, with the overall aims of stabilising and raising prices on world markets. Note that while they are often referred to as ‘cartels’, these agreements have involved the membership of both producing and consuming countries. These international agreements had a chequered history and are generally perceived to have been unsuccessful (at least over a sustained period of time). Gilbert (1996) provides an overview of their history. These agreements have fallen out of fashion, and are unlikely to be revived despite the current disarray on world markets.

A notable example of a state-sanctioned cartel that currently exists is in a market which is closely tied to recent events on world agricultural markets, specifically the world fertiliser market⁵. The world potash market is dominated by a small number of players, with the world’s potash reserves being mainly found in Canada and the former Soviet Union. In this context, Canada has sanctioned a potash export cartel, Canpotex Ltd, whose membership comprises of three companies

⁵ Although the focus of this chapter is on competition issues in commodity and downstream food markets, concerns about competition can also relate to upstream (input) markets such as fertiliser, agrochemical and seed markets, as the case of the Canadian potash cartel testifies.

(Potash Corp, Mosaic and Agrium) and controls about 40% of global trade in potash. Recent attention on the role of Canpotex arose when BHP launched a hostile bid for Potash Corp, with the expectation that the export cartel would not survive if the BHP bid was successful and that production capacity would be expanded and world potash prices would subsequently fall. The legal status of this cartel has raised issues about the links between cartels and the food crisis.

State manipulation of agricultural markets can also be found in the form of state trading enterprises and parastatals. These have been (and are) widely used, and have often been associated with some of the most important participants in agricultural trade, including among many others, Canada, Australia, China, India and Japan. These state trading enterprises are instruments of government policy, where the state enterprise has been granted exclusive rights over procurement and distribution of agricultural commodities. Note that it is the exclusive rights feature that, in essence, defines the nature of the market manipulation where these exclusive rights apply to domestic and export/import markets. In some cases, the exclusive rights apply only to a specific segment of the market (eg to imports or exports only).

These state enterprises matter because, in the context of trade policy measures, they impact on market access or competition on export markets. In other words, they act in a manner similar to other instruments that affect trade, even though their effect is difficult to quantify. Indeed, in terms of current initiatives to measure the tariff equivalence of non-tariff measures, the issue of state trading has been largely set aside. This is because, since state trading enterprises involve the direct manipulation of market structure, determining their effect on market access or export competition is challenging. McCorrison and MacLaren (2005, 2007a) explore these issues. Furthermore, even when reform of state trading takes place, reform is only partial in nature and even though private firms appear to make the market more competitive, there is not necessarily the guarantee that welfare is improved. McCorrison and MacLaren (2011) explore the issues of partial reform. This also carries over to the case of parastatal reform in developing countries, where the concern is that removing the state only leads to a small number of private firms dominating the market and where an improvement in welfare is not necessarily guaranteed. See, for example, Ganesh-Kumar *et al* (2010) and McMillan *et al* (2002).

5.1 Vertically related markets

The focus of the discussion in previous sections dealt with the characteristics of world commodity markets, but we have also noted in Section 4 that commodity prices are not necessarily the same thing as food prices, and that food prices (particularly at the retail level) can behave quite differently from the raw commodity price that reflects transactions on world markets. We also noted that raw agricultural commodities can account for a relatively small share of

the value of the final food product. This is important since, in the context of recent developments on world markets, 'agriculture' and 'food' are often used synonymously. However, they are not the same thing even though they are obviously related. Moreover, in understanding the difference, we also identify an important characteristic of agricultural and food markets and highlight where issues associated with competition are likely to matter.

Specifically, agricultural and food markets represent a complex, vertically related structure where the raw agricultural commodity prices serve as an input cost passing through the vertical food chain such that the retail price of food will be determined by a range of different factors (such as costs associated with labour, marketing services, and other inputs as well as raw commodity prices). The consequence is that the behaviour of retail food prices can be very different from the behaviour of world agricultural prices, as we have noted above. In this vertically related structure, competition issues can arise at any horizontal stage (eg food processing or food retailing) or vertically through, for example, the use of vertical restraints of alternative forms or the terms and conditions of contracts that characterise the links between alternative stages. Note that in this vertically related system, the impact of competition on procurement, not just sales to the subsequent stage, is also an issue in determining the overall competitiveness and efficiency of the food sector (McCorrison, 2008). Moreover, in contrast to textbook models of imperfect competition, where we have a chain of vertically linked markets in which any or all of these stages can be imperfectly competitive, we have a chain of successively oligopolistic markets.

This is an important aspect of understanding commodity and food markets. Even if the raw commodity market is itself competitive, the raw commodity is sold as an input into the downstream food market which may be imperfectly competitive, and this changes the demand curve that producers face. In contrast to the textbook characterisation of a commodity market that we alluded to above, the demand curve facing producers is now the perceived derived demand function, where the slope of this derived demand function reflects the extent of competition in the marketing chain. Moreover, where we have successive stages of the vertically linked food chain that may be imperfectly competitive, what matters is the perceived derived demand functions at each stage. In sum, for producers, the demand function is not the consumer demand function that is defined at the retail stage but the (successively related) derived demand functions that face producers which reflect competition throughout the food chain.

There are clearly many other issues to characterising the nature of vertically linked markets, including the role of contracts and bargaining that link successive stages and where there may be concerns with the abuse of market power, both in terms of buying as well as selling power. But the main point to make here is that if we have concerns about competition in any part of the food sector, it should change how it helps us to characterise the linkages between agriculture and food prices.

Of course, if none of the stages of the food chain are imperfectly competitive we have little cause for concern, so should we be complacent?

Evidence suggests that the food sector in both developed and developing countries is becoming increasingly concentrated. Data for selected European countries puts the average three-firm concentration ratio in food processing in excess of 65% for several countries (including Finland, Norway, Sweden, Denmark and Italy, with France and Spain not far behind). Concentration ratios in the US food manufacturing sector are also high, with an average four-firm concentration ratio of 75%. The retail sector across many countries is also highly concentrated – for many countries across Europe, the five-firm concentration ratio is in excess of 70%. The tendency for increasing concentration. To take some European data to illustrate this, over the 1990s, the five-firm concentration ratio in the UK and France increased by seven percentage points. In Germany, the corresponding increase was ten percentage points; in Austria, 14 percentage points; and in Sweden, 24 percentage points.

One aspect of the modernised food chain is the tendency towards industry consolidation. This is reflected in the growth in the number of mergers and acquisitions in the food sector over the last 20 years or so. McCorrison (2006) highlights the growth in the number of domestic mergers and acquisitions worldwide, with the most obvious reflection of this being the high number of deals recorded year on year. But another important aspect of consolidation has been the internationalisation of the food sector, as witnessed by the growing number of cross-border mergers and acquisitions which have exhibited a strong and consistently upward over the last 20 years. In sum, increasing consolidation and internationalisation is an important feature of the development of the modernised food sector globally (see also Herger *et al*, 2008).

Concerns about competition in the food sector cover both developed and developing countries. Although the data above refers to advanced developed economies, there are concerns about competition in the food sector in many developing countries. Recent examples of competition enquiries into the food sector include South Africa and India. Moreover, even when the commodity is produced solely for export, the extent of competition in supply chains matters. Porto *et al* (2011) explore the issue of competition in supply chains for cash crops with the focus on coffee, cocoa and cotton from African exporters.

There are also concerns about private cartels in food- and agriculture-related markets. Concerns about the recent price spikes across many countries have given rise to investigations into the lack of competition in either fuelling price increases, or taking advantage of increasing input costs to raise food prices proportionately more than the cost increase. Examples of such concerns with cartel behaviour are diverse and include India (sugar and onions), Estonia, Italy, Germany and South Africa, to name a few. There has also been concern over international private firm cartels, an issue which is addressed by Connor (2001).

In summary, the textbook characterisation of commodity markets is inaccurate. Even if we characterise the raw commodity market as being competitive (notwithstanding the issue about state manipulation of market structure highlighted above), in fully understanding the characteristics of commodity markets, we have to recognise what happens in the downstream markets to which the raw commodity is sold. It is here where departures from the competitive benchmark are likely to arise and, given the vertically linked nature of agricultural and food markets, competition issues will matter even if the agricultural market is itself competitive. But beyond characterisation, what difference does it make to how we think about the behaviour of food prices and policy issues that arise?

6 Competition, food prices and policy outcomes

Although there are many potential issues to address where competition may matter, given space constraints we limit our discussion to two related issues – price transmission and the interaction between competition and changes in border prices⁶. As we noted in Section 4, food prices at retail have a tendency to behave differently from raw commodity prices. There are two reasons why we should not be surprised by this. First, as noted, raw commodities represent a relatively small share of the final food price, so we should not expect a 1:1 relationship between the change in the price of the raw commodity and the processed food price. This, of course, is not to say that commodity prices do not matter for inflation; they do, but the relationship is much weaker from what we observe with reference to world market prices. Second, the extent of competition in the downstream food chain also has an impact on the price transmission effect. Under fairly reasonable assumptions, as markets become less competitive, the price transmission effect falls. As the food chain becomes successively oligopolistic, the price transmission effect becomes weaker still. As noted above, there may be other factors that determine the extent of price transmission between world and internal prices (including government policies, infrastructure, exchange rates, and so on), but when considering the effect of raw commodity price changes on (processed) food sold at retail, competition will also matter.

This price transmission mechanism also matters for addressing policy issues in commodity markets. As noted above, government intervention in agricultural markets has been one of the most pervasive characteristics and a considerable amount of effort has gone into negotiating policy reforms (both nationally and in the context of the WTO), with economists playing a valuable role in evaluating the possible benefits from this. But the vast majority of these studies have assumed that, in the context of reform, the agricultural market is competitive. To highlight what difference the lack of competition is likely to make, we draw on an example from Sexton *et al* (2007).

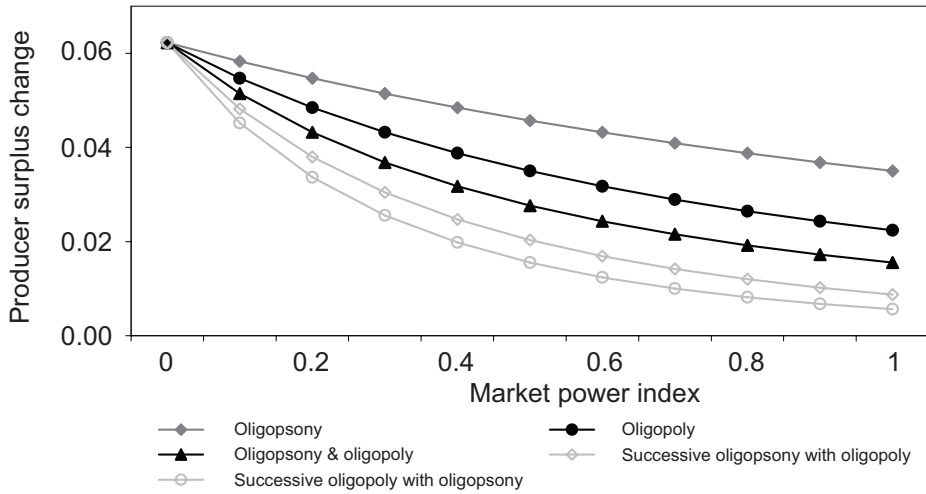
⁶ In the example below, the simulations refer to a change in tariffs but the exercise fits any exogenous change to the border price.

In this exercise, they deal with tariff reform but where market power is exercised in the market immediately downstream from agriculture. Note, in passing, that while the narrative refers here to changing tariffs, the exercise applies to considering any exogenous shock that potentially impacts on the commodity market. The authors calibrated a theoretical model of imperfect competition in the food supply chain, addressing alternative aspects of market power including both buyer and seller distortions, and considered alternative characterisations of market power. A variety of vertical market structures were addressed, including a single stage characterisation with seller power on its own and seller power coupled with buying power and, subsequently, a multiple stage vertical chain with market power throughout (*ie* successive oligopoly) together with buying power *vis-à-vis* raw commodity exporters. The focus of the exercise relates to addressing the impact of trade reform in agricultural markets when there is market power in the stages downstream from agriculture.

In each of the exercises, the benchmark was the competitive outcome (captured with the market power index being equal to zero) with less competitive outcomes being captured by increases in market power as we move from left to right along the x-axis (to a maximum where the index equals one, which represents monopoly/monopsony outcomes). The specific scenario modelled relates to an imperfectly competitive downstream food market, subject to trade barriers on agricultural imports that enter the food industry via the firms' cost functions. These trade barriers are then reduced and exercise focuses on the impact on the exporting developing country. With the developing country exporter assumed to export only but not consume, welfare in the developing country is given by producer surplus. In the developed country, the intermediaries in the vertical chain procure the exported commodity, which is further processed and bought by consumers.

Figure 7 reports the absolute change in producer surplus (*ie* the welfare benefits accruing to developing country exporters) from removing the tariff for alternative competition scenarios. As expected, reducing tariffs increases the welfare of exporters but the extent of this is contingent on the characteristics of the downstream food sector. The figure highlights two main points. For any given vertical market structure, as behaviour becomes less competitive (*ie* as we move from zero to one along the x-axis), the increase in producer surplus falls. Further, as we change the market structure in the vertical chain (*ie* adding on buyer power to seller power and adding successively oligopolistic stages), the increase in the benefits from trade reform accruing to exporters is further mitigated.

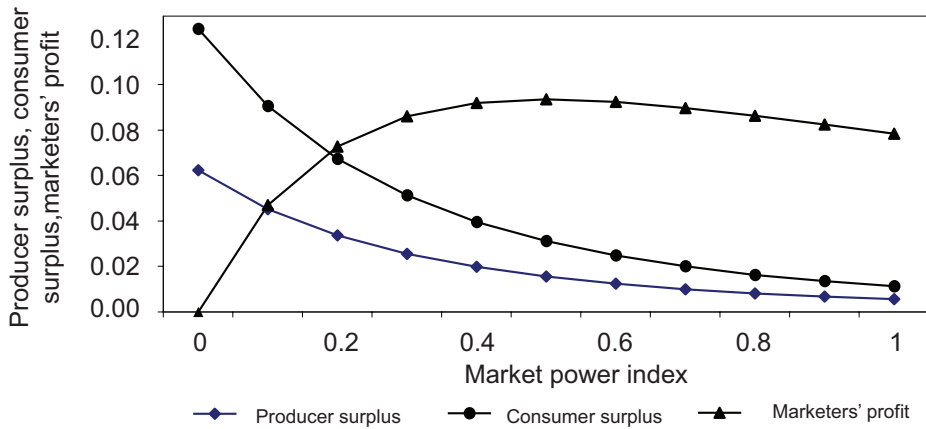
Figure 7 Change in exporters' producer surplus from trade liberalisation



What lies behind these changes is the imperfectly competitive downstream sector that mitigates the effect on export and consumer prices. Therefore, similar to the above, the decline in consumer prices from trade reform will be less as market power throughout the food sector increases and, commensurate with the above, the increase in consumer surplus that you would expect from trade reform will also be dissipated. But if the increase in exporters' and consumers' welfare is being dissipated by market power, where are the changes in welfare leaking to? The answer lies in the profits to the downstream firms.

To highlight these distributional effects but accounting for market power in the food sector, consider Figure 8 which represents the case with successive oligopoly and which clearly demonstrates that the distributional effects of trade reform in a set-up that allows for market power are potentially quite dramatic. Even rather modest levels of market power enable the marketing sector to capture the largest share of the benefits from trade liberalisation, and for very high levels of market power, the marketing sector captures the lion's share of the benefits. Clearly, the presence of downstream market power is an important issue when considering the impacts of trade liberalisation and even small departures from the competitive benchmark can have a marked impact on the distributional effects of reform.

Figure 8 Change in producer surplus, consumer surplus and marketers' profits from trade liberalisation for the case of successive oligopoly with processor oligopsony



5.3 Summary

The important message to take from this discussion about competition issues is that competition matters for how we think about the links between commodity and food prices, and how we think that the impact of exogenous changes in one price will impact on another. Food prices are not the same as commodity prices and while we have some (but not a full) understanding of the latter, we certainly have less understanding of food markets themselves or the behaviour of food prices. Competition matters and even small departures from the competitive benchmark can matter a lot when we address the impact of policy reform or commodity price shocks on the distribution of welfare. Our understanding of the links between commodity and food markets is, however, incomplete and there is a wide range of issues that need to be addressed. We highlight some of the most important ones here.

First, in the earlier sections, we argued that commodity prices are characterised by volatility given the inelastic nature of the demand function. In subsequent sections, we have argued that in the context of vertically related markets, the lack of competition may change the nature of that demand function. If competition influences the impact of price shocks, what influence does it have on price volatility? Moreover, what aspect of imperfect competition may cause consumer or producer prices to become more or less volatile?

Second, does the lack of competition in domestic markets have an impact on world prices that parallels the outcome with trade policy? As we noted above, trade policy has the effect of securing domestic price objectives but at the expense of imposing externalities on trading partners. For example, domestic price stability may be achieved by trade policy but at the expense of increasing volatility on world markets. Do similar effects arise with respect to the lack of

(domestic) competition or the state manipulation of markets? Specifically, if a state trading enterprise promotes domestic price stability but in doing so impacts on market access, does the manipulation of market structure also have an impact on the underlying volatility of world market prices?

Third, the volatility in commodity markets has led to advice on the use of derivatives as a price-stabilising tool. In the context of markets where supply may be stochastic, how do the nature of competition in downstream markets and the role of vertical coordination throughout the food chain determine the exposure of farmers and consumers to risk? Since competition has the potential to influence the dynamics of prices at alternative ends of the food chain, how do competition at each stage of the food chain and the links between stages influence the dynamics of prices and hence the exposure to risk? Most of the research that has been done on the effect of food chains has focused on level effects, but the impact on exposure to risk also needs to be addressed.

7 Conclusion

The focus of this chapter has been two-fold. First, we reviewed some of the basic features of commodity markets that contribute to our understanding of how world commodity prices behave as they do. Second, we reviewed some examples where issues associated with departures from a competitive benchmark in food and agricultural markets may arise. As we have endeavoured to argue here, competition issues matter for understanding the behaviour of food as opposed to agricultural prices, even though agricultural and food markets are obviously linked. Moreover, we have highlighted that departures from competition will matter when considering exogenous changes to markets, whether this arises through commodity shocks or changes in tariffs. We have also highlighted some questions about the potential links between competition and the volatility of prices, where there is a lack of research.

From the discussion above, there are three principal and inter-related issues that arise. First, against the recent focus on price developments on world markets, prices on world markets are not the same as price developments on domestic markets and the prices faced by producers are different from prices paid by consumers. Sitting between producers and consumers is the global food sector that plays a significant role in determining the structure of markets both within and across borders. As such, the textbook model of commodity markets clearing with no market intermediaries is inaccurate, especially when the intermediate food sector comprises a complex series of vertically related markets where departures from the competitive benchmark can arise at one or more segments of this vertically related chain. This matters for understanding commodity price dynamics and the transmission of shocks emanating from world markets to domestic producers and consumers. There is a considerable gap in our understanding of the nature of

price dynamics when we depart from the textbook framework, but it is crucial in fully understanding the extent to which developments on world markets really matter for domestic producers and consumers, and for appropriate government responses.

Second, government intervention in commodity markets has been pervasive and covers both developed and developing economies. This intervention cuts the link between what happens on world markets and what happens domestically. Such government intervention also has feedback effects in determining the level and volatility of prices on world markets. Note that such intervention need not be limited to traditional trade policy interventions and domestic policy towards producers and consumers. Government intervention can also take the form of state-sanctioned departures from competition that may be equally as, if not more, important in terms of their effects compared with traditional trade policy instruments.

Taking these two issues together (*ie* that departure from the competitive benchmark is a potentially important characteristic of commodity and food markets, and government intervention in these markets is pervasive) suggests that policymakers in both developed and developing countries, and the research community more generally, need to pay more attention to how the two interact. With the recent commodity price shocks on world markets, attention has turned to the appropriate response of government policy in ameliorating the exposure to shocks emanating from world markets. At the same time, there is ongoing pressure that trade policy intervention in agricultural markets should be contained if not reduced, given that is a major focus in the, albeit stalled, WTO Doha Round negotiations. However, in fully understanding the role and impact of government policy, and how we generally communicate the benefits of policy reform, there is a need to characterise more accurately how competition in the food sector impacts on its outcome. As we have highlighted in the discussion above, this is not just an issue that is confined to developed countries but it also applies to developing countries where market structure considerations can be just as, if not more, important than those arising in developed countries.

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3 Price Formation and Price Trends in Exhaustible Resource Markets

Evidence and Explanations¹

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This chapter provides a broad, though not always exhaustive, overview of five issues related to exhaustible resource markets. Four of these deal directly with price formation. I start out by considering the forces that drive prices towards their long-run equilibrium, and try to explain why this equilibrium appears to be falling over time. The second issue deals with the anatomy of occasional and usually short-lived commodity booms, raising prices to exceptional levels. There follows an analysis of the likely price impact of financial inflows into commodity markets, a highly debated issue in recent years, still awaiting definitive conclusions. I then consider the successes and failures of producers' attempts to establish monopolistic prices in exhaustible resource markets. The fifth issue deals only indirectly with prices. Instead, it focuses attention on the implications of heavy national dependence on the exhaustible resource sector, and its purported fallacies, 'Dutch Disease' and the 'Resource Curse'.

1 The long-run equilibrium price formation in competitive markets

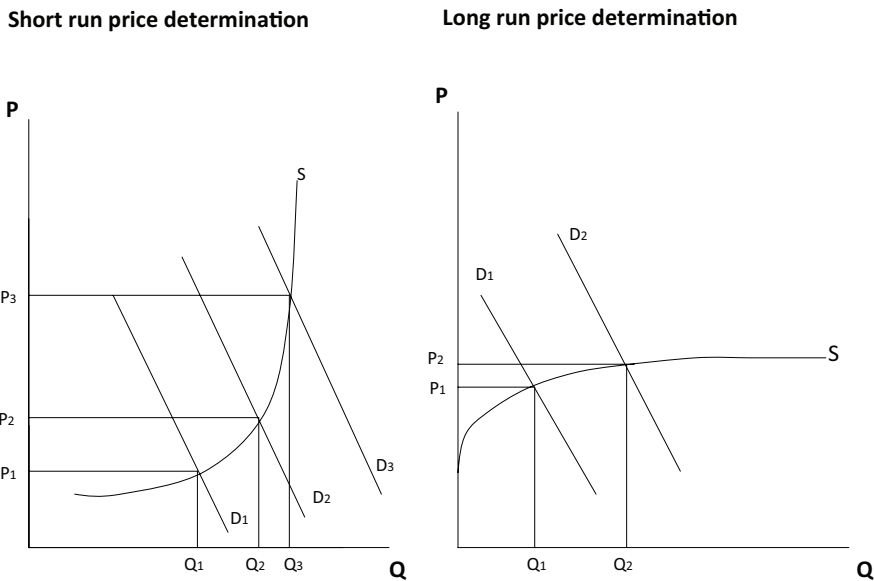
Short-run prices in any competitive market are determined by the intersection of the demand schedule and the short-run supply schedule, the latter representing the average variable costs of existing plants, organised in an ascending order (S in Figure 1, left panel). The supply schedule will become vertical as full capacity is reached, and even small changes in demand will then yield strong price reactions. All this is pretty straightforward, even though the process of constructing the supply schedule may be blurred by unclear perceptions of 'variable', and by deferral of costly supply cuts when a shift in demand is deemed to be temporary. In contrast, more attention is needed to describe the continuous strive of prices towards the long-run equilibrium level.

¹ Valuable comments from Aradhna Aggarwal are gratefully acknowledged.

The long-run equilibrium price level for an exhaustible resource product, too, is determined by the intersection between the demand and supply schedules, but the supply capacity is now permitted to vary. The long-run supply schedule, as it is perceived at each point in time and keeping technology constant (S in Figure 1, right panel), differs from the short-run one in that it depicts the *average total cost of marginal units*, existing as well as potential (Herfindahl, 1959), again ranked in ascending order, as capacity is allowed to vary to satisfy shifting (usually growing) demand at each point in time. The supply schedule rises at first, reflecting the limited resource deposits with exceptionally low costs, but then levels off and becomes relatively flat (Tilton, 2006a). The rationale for the flattening is that the economically exploitable resource wealth tends to become more ample at higher cost levels.

Juxtaposed against the possible cost rise when demand is expanded is a tendency for the entire supply schedule to shift downward over time, as a consequence of cost-reducing technological progress. The two forces – the rising cost representing a rightward move along the schedule, and the cost-reducing technological progress, shifting the entire curve downwards over time – could result in falling or rising equilibrium price levels over time, depending on the strength of each force.

Figure 1 Price determination in exhaustible resource markets



Actual price setting occurs only in the short run. The long-run price, in contrast, is a conceptual artifice, indicating the level towards which market prices will tend to move at each point in time. The intensity of investments in capacity expansion explains why this is so. If the market price is above the long-run equilibrium so that the marginal new project is rewarded with an 'above normal' return, investments will be stimulated, and the expanded capacity will, in time, result in a decline of prices towards the long-run equilibrium level. Conversely, if the market price is below the long-run equilibrium, investments will be restrained, capacity will expand by less than demand and prices will rise towards the equilibrium level. The greater the discrepancy between the market price and the long-run equilibrium price, the stronger the likely investor reaction, and the more powerful the subsequent price adjustment. Though there will always be market forces driving actual prices towards the long-run equilibrium, that equilibrium is unlikely ever to be reached. In practice, it is even uncertain if the level can be unequivocally identified.

2 Real mineral and fuel prices: Generally falling trends and short-run instability

2.1 The long-run price trends

There are two well argued, and opposed, lines of thought about the direction of the trend in long run resource prices. The *first*, mainly theoretical tradition, asserting that resource prices will be rising and deriving its roots from classical economists Adam Smith and David Ricardo, is elegantly synthesised by John Stuart Mill (1848):

'The tendency, then, being to a perpetual increase of the productive power of labor in manufactures, while in agriculture and mining there is a conflict between two tendencies. the one towards an increase of productive power, the other towards a diminution of it, the cost of production being lessened by every improvement in the process, and augmented by every addition to population: it follows that the exchange value of manufactured articles, compared with the products of agriculture and of mines, have, as population and industry advance, a certain and decided tendency to fall.'

The assertion of rising resource prices due to increasing cost pressures caused by depleting resources in the ground remained out of vogue for a long period during the 20th century because it was contradicted by many empirical observations. From the early 1970s, however, it attracted temporary but intensive attention following the publication of the Club of Rome reports about an impending general resource exhaustion (Meadows *et al*, 1972), and then again from the mid-2000s,

when fears of rising scarcity resurfaced in the proclamations of impending ‘peak oil’ and similar production peaks for many other natural resources (Radetzki, 2010). Interestingly, these two periods of exhaustion fears coincided with the strongest commodity booms since the Second World War (see Section 3).

The *second* tradition is founded on empirical observations, and asserts a falling trend in real resource prices. It was originally developed by Hans Singer (1950) and Raul Prebisch (1962), who argued that there is an asymmetry in the response of prices to productivity gains between raw materials and manufactures. The markets for the former are highly competitive, so any productivity improvement leads to a price decline. The monopolistic organisation of the labour and capital employed in manufacturing industries, in contrast, enables the labour and capital employed in production to reap the benefit of productivity gains in the form of higher income. The Prebisch-Singer explanation of falling raw material price trends aroused an extended debate. The critics remained unconvinced, even though the upward trend of oil prices since 1974, resulting from OPEC’s market management, appears to support the Prebisch-Singer view (Figure 3, below).

An additional and possibly related argument employed by Singer in support of his assertion of falling raw materials prices is that since the income elasticity of demand for most commodities is low, the slower growth of demand as income expands would tend to yield a weaker price development.

Many empirical attempts at establishing the long-run resource price trends in constant money have been undertaken, with Cashing and McDermott (2002), Cuddington *et al* (2007), Grilli and Yang (1988), Hadass and Williamson (2003) and Harvey *et al* (2010) among the more recent ones, and they have yielded quite varied results. Depending on the end points of the series, the countries whose trade is covered, the materials included and the deflator used to express the series in constant money², the outcomes of these investigations have typically ranged between stagnant and substantially declining price developments, posing a question mark on the thesis formulated by the classical economists.

2.2 How to explain the absence of signals of resource exhaustion in the price evidence

Because long-run price tendencies in competitive markets must reveal the development of long-run total costs of the marginal project, it follows that the decline in real exhaustible resource prices, noted in several of the quoted studies, must have been caused by gradually reduced total costs of marginal supply. The

2 A number of deflators can be employed to convert the nominal price series to one in constant money, eg (a) the implicit deflator of the GDPs for the OECD area as a whole, expressed in US dollars; (b) the implicit GDP deflator for the United States; (c) the US producer price index; (d) the US consumer price index; and (e) the index of dollar prices of manufactured exports (cif) from major industrialised countries (the MUV index). Each of these deflators has its advantages and shortcomings and the real price developments can differ substantially depending on which is used.

observation that accentuated depletion over time, in the Hotelling (1931) sense, does not appear to make a dent to the historical price data appears to be counter-intuitive when seen against the background of the quote by John Stuart Mill, reproduced above. In addition to the Prebisch-Singer thesis on who appropriates productivity gains, I propose three possible explanations to this dichotomy.

The absent signs of depletion in the price evidence could *first* be due to an exceedingly ample resource wealth, upon which exploitation until the present has had only an imperceptible impact. This explanation, which keeps open the possibility of depletion assuming significance in the future, runs very much counter to conventional wisdom (Meadows *et al*, 1972; Roberts, 2004). It would suggest that exhaustible resource product costs are governed by the same forces as manufactured goods costs and that the two should therefore run in parallel. However, it fails to account for the decline observed in resource product prices.

A *second* reason could be that the exhaustible resource industries have been subjected to much more intensive technological improvements than has the manufacturing sector. This sounds unlikely. There is no empirical evidence of such intersectoral difference. Furthermore, one could surmise that technological improvement efforts should focus on sectors with rising costs and prices, for this is where the incentives to improve and profits from technological progress should be greatest. This explanation, therefore, is not very convincing.

A *third* explanation to the declining long-run real price trend is that it represents a statistical artifact. Two issues are involved.

- (a) Transport costs ordinarily constitute a higher proportion of the delivered price of raw materials than of manufactures. The spectacular fall in transport costs over the past 150 years should therefore yield a stronger decline in CIF commodity price quotations, often used to represent raw material price developments, than it would in other price series.
- (b) The real prices for exhaustible resource materials are obtained by deflating the nominal prices by an index of general inflation, eg the consumer price index, or an index of manufactured goods prices, juxtaposing the latter against the prices of raw materials. In both cases, the deflator will be highly dependent on the evolution of manufactured prices and the way the latter are measured will be instrumental for the trend of real (deflated) exhaustible materials prices. The point at issue is that raw materials remain, by and large, unchanged over time, while the quality of manufactures is continuously improving, as witnessed by the superior performance of, say, a tractor or an electric light bulb of a 2010s vintage compared with the performance of the same products 50 or 100 years ago. Price indexes dominated by manufactures regularly exaggerate general inflation, by failing to fully catch the quality improvements over time of manufactured products. This bias in the deflator used to obtain real raw material prices will tend to suppress

the latter trend and could make it negative. Svedberg and Tilton (2006) demonstrate for copper that long-run real prices have been rising, not falling, when appropriate quality adjustments are made to the deflator to catch the quality change of manufactures, and they suggest that similar results may hold for a wide array of exhaustible resource materials.

2.3 Short-run price instability

'Rapid, unexpected and often large movements in commodity prices are an important feature of their behaviour' (Cashing and McDermott, 2002). This is a well-known and oft-repeated statement, as is the observation that the prices of manufactures tend to be more stable. Illustrations of violent commodity price gyrations, up as well as down, over relatively short time spans are easy to identify from monthly or quarterly price series regularly produced by the IMF and UNCTAD.

It is equally easy to point to the main reasons for the sharp commodity price instability. The price elasticity of demand for raw materials is usually quite low, given that the cost of such materials typically constitutes a small proportion of the finished product prices. Furthermore, a given increase in demand for finished products will regularly result in a more accentuated increase in the demand for the raw materials employed, as the desired inventories are augmented from the finished product marketing stage back through the consecutive stages of the entire production chain.

Fluctuations in supply, too, contribute to price instability. Mineral supply can shrink due to strikes or technical accidents. Like the price elasticity of demand, that of supply would be quite low, especially when existing capacity is close to fully utilised (which is normally the case in competitive markets). In minerals and energy it takes an extended period of time to add to supply capacity, and in the meantime even small disturbances in supply or unexpected increases in demand will result in sharp changes in price.

The above, then, are the main explanations for the short-run price instability observed in most mineral markets. Such instability is believed to cause serious macroeconomic problems to countries that are heavily dependent on mineral exports (Keynes, 1974; Behrman, 1987; Sachs and Warner, 1999). Shock absorbers in the design of macroeconomic policy are warranted to reduce the impact of this instability (Davis and Tilton, 2005).

3 The anatomy of occasional commodity price booms

Commodity booms are defined, for the purpose of the present analysis, as sharp simultaneous increases in the real price of a broad group of commodities. Using this definition, it is possible to identify three such booms in the period since the Second World War, beginning in 1950, 1973 and 2003 (Radetzki, 2006). They were all triggered by demand shocks, caused in the first example by hoarding in anticipation of supply disruptions following the outbreak of the Korean War, combined with an exceedingly speedy global macroeconomic expansion. In the second and third commodity booms, the fast worldwide economic expansion was enough to prompt the changes in commodity markets. In all three cases, raw materials producers were unable to satisfy the accelerated growth in demand, and prices exploded in consequence.

There are important differences between the first two booms and the third one which still prevails at the time of writing (June 2011). The 1950 and 1973 booms were of short duration. Within a two-year period, prices were punctuated to more 'normal' levels as commodity demand fell in the economic recession that succeeded the macroeconomic expansion, and by de-stocking in the first boom as it became clear that supply disruptions due to the war would not be severe.

In the third boom, commodity prices started their rise in 2003 and remained at very elevated levels for almost five years. The price trend was reversed only in 2008, when the financial crisis hit the world and threatened to push it into the worst recession since the 1930s. These threats did not materialise and, within a year, the prices had recovered strongly, in many cases exceeding the earlier peaks of the decade. Commodity demand continued to expand strongly, despite a marked reduction in the global economic growth rates from the pre-financial-crisis levels. According to the IMF (2011), world GDP expanded by an annual average of 5.1% in 2005–07, and by 2.5% in the following three years. Two features that distinguish the concurrent commodity boom from its two predecessors require elucidation. *First*, how can the almost uninterrupted brisk expansion of commodity demand since the financial crisis be reconciled with a much slower global economic growth? And *second*, how long will the exceedingly elevated commodity prices persevere if growth of commodity demand continues undisturbed?

Commodity demand in the international market during the booms of 1950 and 1973 was completely dominated by the OECD region. The communist countries were isolated, while what happened in the developing world was insignificant and could be disregarded. Conditions during the current boom, following the opening up of China and decades of historically unprecedented economic growth in emerging economies, are radically different. Consider developing Asia alone, which in 2010 accounted for 24% of global GDP compared to 52% for the OECD region (IMF, 2011). Developing Asia is currently passing through a development stage much more intensive in primary materials use than the

dematerialising, mature OECD economies. Hence, it can safely be taken that a dollar added to developing Asia's GDP absorbs more than twice the quantity of commodities as does a corresponding dollar's growth in the OECD countries. On this calculus, the two regions would contribute about equally to commodity demand growth, provided that both expanded at the same rates. But since developing Asia's economies expanded at 5.3 times the OECD rate between 2001 and 2010, it follows that its contribution to commodity demand growth completely overwhelmed that of the OECD. The importance of developing Asia in this respect is a new phenomenon. Furthermore, developing Asia went virtually unscratched through the financial crisis. While OECD GDP declined by an annual average of 0.1% in 2008–10, the growth recorded by developing Asia in this three-year period averaged 8.1%, practically the same as for the entire past decade. The combination of developing Asia's dominance in global primary commodity demand and its remarkably steady economic growth performance, then, explains why prices had only a temporary hiccup when the financial crisis broke out.

The commodity boom yields excessive profits to virtually all producers, creating strong incentives to invest in expanded capacity. So, if the boom is not punctuated by stagnating or falling demand, it surely must end once enough capacity has been built to assure the satisfaction of demand at prices that do not exceed the long-run equilibrium level. In metal minerals, five years or so are needed from a decision to invest in a greenfield project until production startup (Tilton, 2006b), and maybe slightly more to put new oil deposits into production. One might therefore suppose that adjusting capacity to a new level and/or pace of growth of demand should not take much more than half a decade, so the durability of the commodity boom should not be much longer. In reality, things are more complex than that. Several issues are involved (Radetzki *et al*, 2008a).

First, decisions to invest in new capacity depend on the existence of proved reserves. Second, even when deposits readily available for development exist, a number of lags are likely to occur before such decisions are taken. Investors and their financiers will need time to be convinced that the higher prices are not a transient feature, but will remain beyond production startup. Regulatory lags have become an increasingly time-consuming hurdle during the current century. Foremost among these are the ones related to the environment, where the investor first has to prove to the authorities that the project complies with existing legislation, and then to the local communities that their rights will not be harmed.

A third delaying factor in investment completion is likely to occur when many exhaustible resources experience high prices at the same time, as has been the case in the course of the concurrent commodity boom. The elevated prices then trigger an investment frenzy where producers of many commodities attempt to expand production capacity at the same time. This was clearly the case in the minerals, metals and fossil fuel markets from 2004 to 2008 when all investment

inputs, from truck tyres, drills and oil platforms to mining and oil engineers, became so scarce that prices rose, and extended delivery queues developed. A temporary relief to the scarcities occurred in 2009, as the financial crisis hit the world economy, but the investment frenzy reappeared forcefully one year later.

The frenetic demand for investment inputs, in turn, has given rise to accentuated efforts to expand the capacity in all industries, including the engineering schools that provide inputs to mining and petroleum. Eventually, the sectors that produce such input supplies will reach a new equilibrium but, in the meantime, the completion of investments in the minerals and oil industries will be delayed. For these reasons, there could well be ten rather than five years between decisions to invest and production startup. This, then, would be the maximum duration of a forceful and widespread commodity boom in competitive markets.

It should be noted that the trigger to a commodity boom is the disequilibrium caused by a speedup in demand growth, not the pace of demand growth *per se*. Adjustments to equilibrium are feasible even in the presence of very fast growth rates. For example, aluminum, whose global demand rose 40-fold in the 30-year period 1939–69 (13% per year), experienced persistently falling real prices at the same time (Schmitz, 1979).

4 What do we know about the price impact of financial investors and speculators?

The current commodity boom has coincided with an extraordinary inflow of financial capital into commodity markets. The simultaneity of the two phenomena has given rise to vocal assertions that ‘speculative’ capital has been behind the harmful explosion and instability of commodity prices (Masters, 2008; USS/PSI, 2009). These assertions have aroused a lively political discussion, in particular in the US, UK and France, arguing for the introduction of new regulation to get to grips with commodity price bubbles by limiting the scope of speculation (*Economist*, 2007; *Financial Times*, 2008a; 2008b; 2010).

Financial investment in commodities is, of course, nothing new. For as long as the commodity markets have existed, there have been those who have sought to make money by buying commodities for the sole purpose of selling them at a higher price later on. What is new is the mode and scale of investment interest in this asset class.

One financial inflow that has old antecedents arises when the contango (excess of futures over spot prices) exceeds storage and interest costs. Financial agents will then buy spot and hold the physical commodity, while simultaneously selling the higher priced futures to profit from the arbitrage. This kind of financial interference in commodity markets regularly takes place in times of market

depression, for this is when strong contangos occur. By financing inventories, the capital inflow relieves producers from the burden of stock holding. Spot purchases will raise spot prices while forward sales will tend to suppress quotations in futures markets, thus weakening the profitability of such action. In any case, the opportunity for gains will disappear and the financial flows will cease when the depression in the commodity market is overcome, thus reducing or terminating the contango. It is hard to find harm in this kind of intervention in commodity markets.

Commodity Index Funds (CIFs) represent another major financial involvement in commodities. This instrument represents the dominant new form in which finance flows into commodity markets. Investments amounted to less than \$10 billion at the beginning of the 2000 decade (Kat, 2006), but they rose to almost \$200 billion by 2010 (CFTC, 2010). A variety of portfolio managers, comprising pension funds, mutual funds and hedge funds, have made placements in CIFs. To spread risk, most of the investments have been made in broad commodity indexes, *eg* the Goldman Sachs Commodity Index, the Commodity Research Bureau Index and the Dow Jones AIG Commodity Index, but there is nothing to preclude investments in individual commodity futures. Placements are made in futures contracts (say, 12 months into the future) which are then rolled over before they mature (the original investment is sold, say, one month before expiry, and a new 12 month future is acquired instead).

Returns to the investors are seen to comprise three elements (Gorton and Rouwenhorst, 2006):

- (a) An increase in the spot and futures commodity price levels.
- (b) A roll return which will be positive so long as the commodity market remains in backwardation (futures prices below spot prices).
- (c) A collateral return: since investments in the futures commodity index require no more than a small margin payment, most of the committed capital can be used to purchase treasury bills, with the interest received attributed to the commodity investment.

The respective returns will turn negative if (a) commodity prices decline, and (b) the backwardated market turns into contango.

A number of studies, both theoretical and empirical, have been launched to explore the impact of the phenomenal growth of CIFs on commodity prices. These are neatly summarised by Irving and Sanders (2010), who conclude:

'Some of the studies find evidence that commodity index funds have impacted commodity futures prices.... A number of studies find little evidence of a relationship between index fund positions and movements in commodity futures prices.... In sum, the weight of evidence clearly tilts

in favour of the argument that the index funds did not cause a bubble in commodity futures prices.'

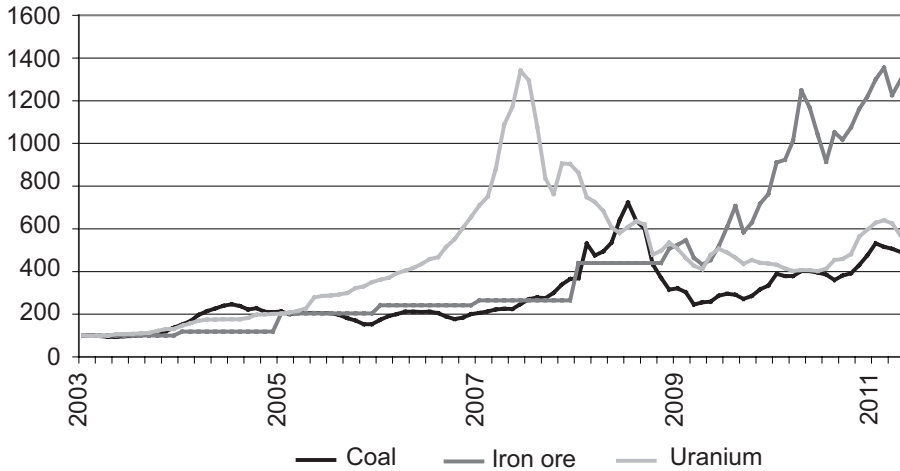
The theoretical studies that are reviewed by Irving and Sanders devote primary attention to the logical consistency or inconsistency of the argument that these financial inflows impact on prices.

All the existing empirical studies suffer from deficient data availability. The Commodity Futures Trading Commission in the US (CFTC) has, for many years, been reluctant to release the data it collects on futures positions by trader category and, in any case, the trader categorisation it employs leaves much to be desired in distinguishing between 'commercial' and 'non-commercial' positions, the latter intended to show speculative inflows. The CFTC database focuses on the US, and much less is known about the world as a whole. Inventory change, a critical variable in speculator impact analysis, suffers from similar data problems. Reasonable numbers are available for stocks on official exchanges, but hardly anything is known about other inventories, especially in the emerging economies that are becoming increasingly important in the commodities world. The results of, for example, the IMF's (2006; 2010) econometric investigations suggesting that financial inflows have had little impact on prices must be judged against the problem of inadequate availability of data and their deficient quality.

An important empirical observation that goes against the case of damaging speculation is that, in some cases, disruptive price increases and price volatility have been even stronger in commodities that are not traded on exchanges with regular futures quotations, and that consequently offer very limited scope for CIF entry. This is the case of iron ore, coal and uranium, whose price history since 2003 is depicted in Figure 2, and compared with that of aluminum, copper, lead and oil in Figure 3. For easy comparison, both figures use the same scale and provide an index with the starting month, January 2003 = 100. The former group has experienced considerably more pronounced rises and fluctuations than the latter.

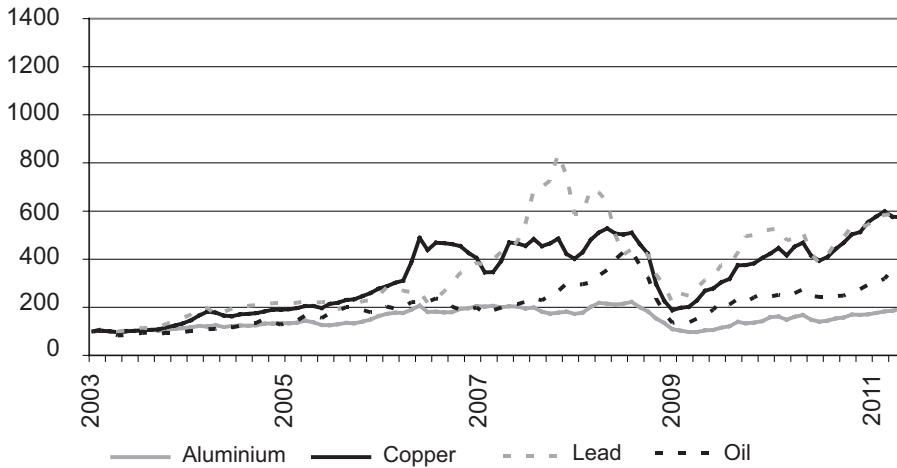
The understanding of how financial inflows and speculation impact on commodity markets and prices is clearly incomplete. New regulation to restrain speculation appears ill-advised when the thrust of analytical efforts points to a weak relationship, if any, between the two. Regulation could cause damage to market functioning by reducing liquidity. At this juncture, it would appear more appropriate to let policy initiatives in this area be preceded by public efforts at data collection and dissemination, and follow-up empirical investigation, to bring about a better understanding of the problem, if indeed a problem exists.

Figure 2 Commodities traded in markets without futures, monthly index, Jan 2003=100



Source: IMF statistics.

Figure 3 Commodities traded in markets with futures, monthly index, Jan 2003=100



Source: IMF statistics.

5 Producers' failures in managing the market to their advantage

Monopolistic market power is directly related to the share of supply provided by the collaborating producers and to the price elasticities of demand and of supply from outside the collaborating group. The higher the share and the lower the

(absolute) price elasticities, the stronger the market power and the ability of the producers to extract monopolistic prices. To be of significance, market power has to be durable. It will ordinarily be diluted over time as consumers adjust by reducing their demand in response to higher prices, and with the emergence of independent supply attracted by the augmented price level. Price elasticities that appear to be very low in the short run typically prove to be much higher when a longer time period is considered. Emerging new supply outside the control of the collaborating producer group will reduce its ability to manage the market. Monopolistic market management is less likely to be launched if the producers sense that their gains will be temporary while the loss of their market share, or contraction of the overall market size, may be permanent. Nevertheless, history reveals many attempts at commodity market management, with producing country governments often assuming an active and sometimes leading role, along with the producing enterprises.

The popularity of price-raising commodity cartels appears to occur in waves, usually triggered by some outside events. The most recent such wave was in the 1970s. Subsequent decades have seen an increasing reliance on the markets and an improving trust in their functioning. Cartels have hardly ever been long-lived. Discipline among members has been hard to maintain, while the aggressive price policy has typically led to stagnant demand and rising independent supply, leading eventually to the cartels' disintegration. The widespread failures to extract monopolistic prices on a sustained basis provide a clear sign that most international commodity markets operate under reasonably competitive conditions.

In the 1930s, a number of price-raising international commodity cartels were established by the producers in agricultural, as well as in mineral, commodity markets. The trigger was, somewhat counter-intuitively, an exceedingly low price level that reined during the great depression (Rowe, 1965). The monopolistic actions were widely viewed with sympathy and were overtly supported by the governments of the consuming countries, including the US government. Higher prices were seen as essential for the maintenance and expansion of commodity production, sometimes even for the survival of producers, and, at a wider level, for the restoration of world prosperity (Herfindahl, 1959). These cartel efforts were overtaken by events following the outbreak of the Second World War, with ensuing scarcities and far-reaching government controls.

Another wave of commodity cartel action occurred during the 1970s, following widespread nationalisations of mineral resources after Third World independence, and due to the high prices during the second commodity boom. A perception of 'commodity power' emerged among Third World producing governments, and efforts were launched to establish producer associations, mainly in minerals, with price-raising as the primary goal. The successes of OPEC (see next section) created enthusiasm among other commodity producers. Producer efforts to raise

prices were successful in some cases, though short-lived. In other cases, no visible price impact can be detected from the attempts at market intervention.

The attempts to rig the market in favour of producers for some major minerals are briefly described in the following paragraphs.

5.1 Bauxite

In the late 1960s, Jamaica began to urge the governments of bauxite-producing countries to form an association for the exchange of information, reduction of rivalries, the establishment of a joint front to the multinational aluminum companies, and coordinated increases of export taxes (Brown, 1980). A group of bauxite-producing countries founded the International Bauxite Association (IBA) early in 1974. By 1975, its members accounted for 85% of non-socialist world output. The production units were predominantly owned by the vertically integrated aluminum companies, and bauxite had no meaningful market price. The government group, therefore, largely operated by increasing production and export taxes.

At the time, Jamaica was the second largest producer and its government instituted sharp increases in its take that went beyond the geographic advantage of Jamaica in the US market. The government expected that others would join the action, and so eliminate the initial loss of Jamaica's competitiveness. Surinam followed suit but Australia, the world's largest producer and an IBA member, refused to participate in these interventions. The market share of Jamaica fell from 22% in 1974 to 11% in 1982, that of Surinam from 10% to 5%. The two countries' pain was accentuated by a fall of global bauxite demand during the extended world recession following the 1973–74 oil crisis.

The Caribbean policies clearly favoured Australia and Brazil, who declined participation in the market management and whose market shares rose briskly. Jamaica, the original founder of IBA, formally withdrew its membership in 1994 and the association collapsed soon after (Crowson, 2006).

5.2 Phosphate rock

Booming demand and the example of OPEC led to a decision by the state-owned Moroccan phosphate rock producer, Office Chérifien des Phosphates, to more than quadruple its producer price in the course of 1974. In the short run, this intervention was highly effective because the state-owned phosphate enterprises of Algeria, Togo and Tunisia and the mixed-owned producer in Senegal, along with the members of the US export cartel,³ Phosrock, raised their list prices in

³ US legislation does permit export oriented cartel measures, so long as there is no impact on the domestic market.

close concert with the Moroccan action. The entire group accounted for more than 70% of global phosphate rock exports at the time, almost half of which came from Morocco (UNCTAD, 1981).

However, the success proved short-lived. In 1975, a severe world recession reduced demand. The high prices also resulted in deferred farmer demand and substitution in favour of other fertilizer raw materials. Under this pressure, the Moroccan phosphate rock price was reduced and, by 1977, it was back to its pre-cartel days when measured in real terms (UNCTAD, 2000).

5.3 Uranium⁴

The international uranium mining industry entered the 1970s in a state of profound depression. It had been built to satisfy the huge military demand during the 1960s. With the military needs fully covered by the end of the decade, the existing uranium capacity was far in excess of nuclear reactor needs for many years into the future. The low prices did not cover costs for a large segment of the industry, so many producers left the business.

The depressed market was the trigger that brought producers together. A series of meetings initiated by the government of Canada took place in 1971. The governments of France and South Africa were represented, and leading private producing companies from a number of countries took part. The meetings were intended to 'put some order into the international uranium market... to coordinate uranium production and marketing policies' (*Nucleonics Week*, 1971).

This embryo to the uranium cartel was quite frail while the market remained weak. At the end of 1973, however, a number of unrelated but coincidental factors completely reversed the market situation. The most important of these was a decision by the US enrichment agency, at the time a state-owned virtual world monopoly, to require that enrichment services be commissioned decades in advance, with high penalties for cancellation. Owners of existing and planned nuclear reactors signed up to excessive enrichment contracts, and then went on a buying spree to secure their future uranium needs.

The uranium producers responded by temporarily withdrawing from the market, and the prices exploded. The spot price rose from less than \$7/lb U₃O₈ in late 1973, to more than \$40 by 1976, in spite of a non-socialist world output increase of 15% between the two years. Prices in long-run contracts signed in this period followed suit. The producers re-entered the market only after prices had reached the \$40 level. The cartel worked under very favourable conditions, and the prices stayed high through most of the 1970s.

⁴ This draws on Radetzki (1981).

The subsequent decline was caused by an increasing realisation among the nuclear utilities that they had greatly overcommitted themselves to uranium purchases, so demand was sharply reduced. New production came on stream by the end of the 1970s, and discoveries of large and very rich uranium deposits in Australia and Canada altered earlier perceptions of impending scarcity. After five years of exceedingly high profitability, the prices in constant money were back to the depressed levels that had prevailed before the cartel burst to life.

5.4 Copper and iron ore

Two further attempts at establishing commodity cartels in metal mineral markets need to be mentioned, but they can be treated briefly since they both failed to institute effective price-raising measures (Crowson, 2006).

CIPEC, the Intergovernmental Council of Copper Exporting Countries, was formed in 1967 by the governments of Chile, Peru, Zaire and Zambia for the purpose of raising prices through collective interventions in the copper market. Yugoslavia and Indonesia joined later, while Australia and Papua New Guinea became associates. Enthused by OPEC's success, CIPEC tried in 1974--76 to raise prices with the help of production cuts, but the efforts failed due to mistrust among members and because the eight participants controlled too small a share (37% in 1975) of global mine supply. CIPEC subsequently dwindled in importance due to the collapse of production in Zaire and Zambia, and the withdrawal of some members. It was formally dissolved in 1988.

The Association of Iron Ore Exporting Countries (APEF) attempted to set export prices in 1975. The effort was unsuccessful; first, because two important members, Australia and Sweden, were unwilling to go along, and second, because Brazil and Canada, both sizable export suppliers, refused even to join. APEF reduced its role to collecting statistics on market trend, until its demise in 1989.

6 Oil is exceptional

The oil cartel is exceptional in that it has survived and succeeded in imposing monopolistic prices over a period now approaching 40 years. For this reason, and also because the oil market is so much bigger than any other commodity markets (the value of international oil trade is about 20 times the value of copper or coal trade, and 50 times the value of wheat trade), the history of this cartel and its modes of operation deserve more detailed attention.

The Organization of Petroleum Exporting Countries (OPEC) was brought into existence in 1960. Its main purpose was to form a united front by member governments in an attempt to arrest the fall in revenue per barrel in the face

of excessive world oil supplies (Griffin and Steele, 1986). By the early 1970s, the excess supply had been exhausted as a result of a very fast growth in world oil consumption (8.3% compound annual growth between 1960 and 1972).⁵ In 1973, the sellers' market became even more accentuated due to the global macroeconomic boom, which led to a sharp jump in demand and price for virtually all primary commodity prices. Late in the year, the OPEC governments agreed to roughly triple the posted prices used to determine the fiscal dues, and the vertically integrated international oil companies passed the increase on to the final consumers. With the fast economic growth, there was little need for production adjustments by the cartel in response to the higher price. A large part of OPEC production capacity was nationalised during the decade, strengthening the governments' ability to intervene in the market and reducing the relevance of posted prices.

In 1979–80, there was another strong upward move in market prices resulting from reduced Iranian supply after its religious revolution, and later from the outbreak of the Iran-Iraq war. While this second price rise was not caused by OPEC's own actions, the cartel was instrumental in maintaining the very high price through successive downward adjustments in supply.

In the 1980s, OPEC experienced increasing difficulties in its efforts to defend prices. The longer-run price elasticities turned out to be much higher than the short-run ones. World demand for oil stagnated as oil ceased to be used in power production. Annual global demand growth between 1973 and 1986 settled at 0.4%. Demand in the OECD fell by 14% over the period, despite a 40% expansion in the area's GDP. Supply outside OPEC, which had been stagnant at 18–19 million barrels per day until 1977, rose to 27.7 million by 1985. From a full capacity utilisation output of 31.5 million barrels per day in 1979, OPEC had to reduce production to 16.2 million in 1985 to maintain the high price. The Saudis' preparedness to cut output from 10.2 million barrels per day in 1979 to only 3.4 million in 1985 was crucial for the defence of prices.

At this juncture, the cartel realised that the exceedingly high price was not in its own interest. Following internal controversy, output was increased by 2.6 million barrels per day, prices declined by almost half in early 1986, and the cartel's revenue was sharply cut. There followed a 14-year period of relatively stable (real) prices which, though modest in comparison with the 1974–85 period, nevertheless remained more than 60% above the pre-1974 level.

In the mid-2000s, oil prices exploded once more, initially as a consequence of a rising assertiveness by the cartel group, combined with disciplined production cuts. The upward price pressures were soon amplified by political supply problems in the Middle East (the 2003 war in Iraq). On top of this came the general commodity demand shock which triggered the concurrent commodity boom.

⁵ All production, consumption and proved reserve figures in this section are from BP (annual).

The cartel has influenced prices with the use of two instruments. In the short run, it has purportedly ‘stabilised’ the price level by adjusting capacity utilisation to maintain prices within a desired band that has moved both up and down, but with an historical upward bias. Thus, reductions occurred in response to curtailed oil demand during the 1997–8 financial crisis in East Asia, and again to the global financial crisis of 2008. On other occasions, capacity utilisation was raised to arrest threatening price explosions, such as when Russian output fell in the early 1990s, to neutralise the effects of the 1990 Iraq-Kuwait war, or when Libyan production ceased in 2011. Price stabilisation was not particularly successful, and prices regularly settled outside of the desired range, partly due to weak quota discipline among members. In some cases, the desired price band was changed. This was dramatically the case in 1986 when OPEC decided against the defence of a very high price, and again, in the late 2000s, when booming demand and elevated prices led the cartel to roughly triple its desired prices to around \$80 per barrel. Saudi Arabia’s dominance in the group (its production has hovered between one quarter and one third of the total most of the time) and its willingness to keep production capacity in reserve has been instrumental for OPEC’s short-run policies. Even so, I assert that OPEC’s ability to command monopolistic power would have disintegrated, much like what happened with the other cartels described above, if it had relied solely on short term output adjustments.

Table 1 World oil production, mbd, share, and percentage change

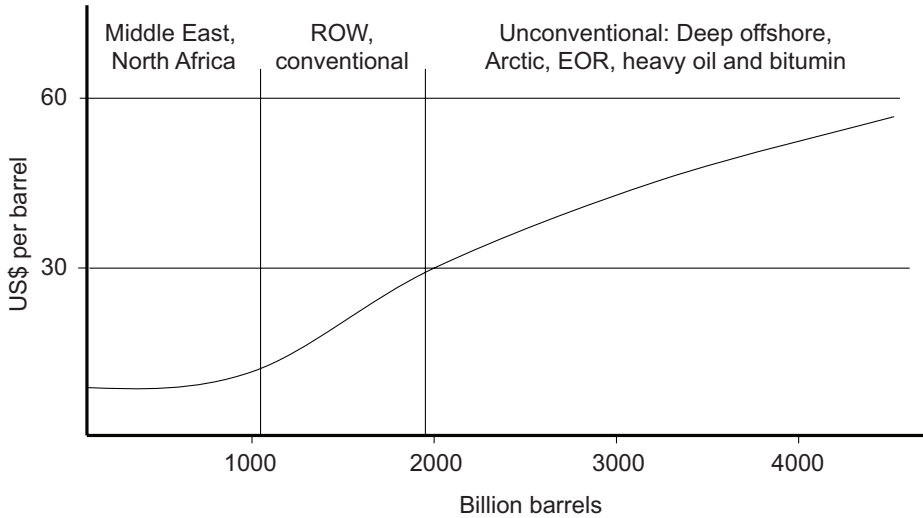
	1979	2010	Change, %
Middle East, North Africa OPEC	21.4	26.9	25.7
Other OPEC	10.1	7.6	-24.8
Total OPEC	31.5	34.5	9.5
OECD	14.7	22.1	50.3
Former Soviet Union	11.9	13.6	14.3
Rest of the world	7.7	17.2	123.4
Total World	65.8	87.4	32.8
OPEC share, %	47.9	39.5	-17.5

Source: BP (annual); IEA (monthly).

The long-run tool that has held the cartel alive is a remarkable constraint on capacity expansion, whether by conscious policy or by default. Reliable capacity figures are hard to obtain, but Table 1 provides a proxy of capacity by presenting production numbers for 1979 and 2010, years with elevated prices and global capacity near full use. A study of the table requires awareness of OPEC’s unique natural resource position, a precondition for the cartel’s strength and perseverance. OPEC members account for 77% of global proved reserves, none of which come anywhere near the top of the global cost curve. Even more important is the Middle East-North Africa (MENA) ‘geological anomaly’ (Figure 4). This region’s OPEC members control over 60% of global proved reserves, all

exploitable at exceedingly low cost. Assessments by the IEA (2001) put the total average cost of supply for MENA majors at \$4 per barrel, so even at a price of \$10 (only occasionally touched since 1974), production in the region remained hugely profitable.

Figure 4 Oil resources and economic price, 2008



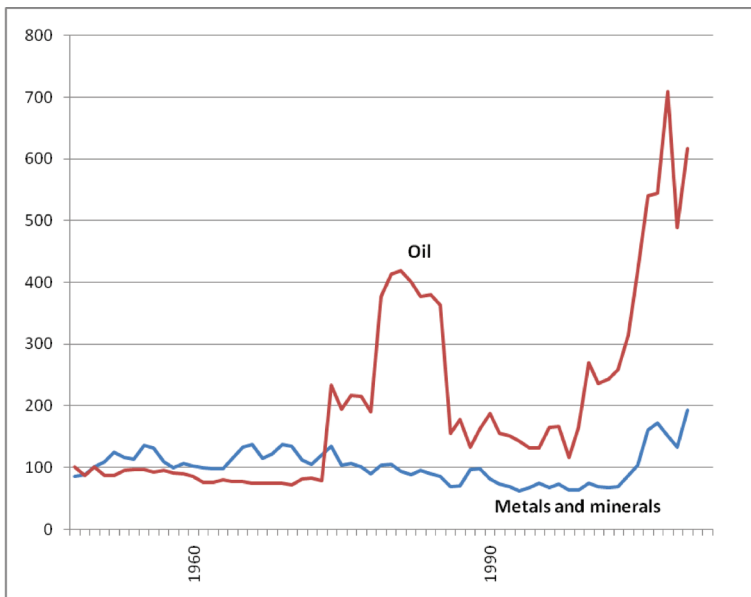
Source: IEA (2008).

In a market characterised by competition, one would expect OPEC countries, and in particular its MENA members, to dominate global capacity and production growth over time. The numbers in Table 1 reveal a different picture. In the 31-year period shown, the far less richly endowed 'rest of the world' and OECD account for the major increases of capacity and output growth, while the contributions of OPEC and its MENA subgroup are far below overall market expansion. A conscious restraint on capacity *increase* has been a key (but not the only) element in the cartel's policy to extract monopolistic prices. The long-run viability of this policy hinges on the exceptional resource position of a small group of countries, in a small geographical region, without parallel in other exhaustible resource markets.

But other forces have also been at work in constraining the expansion of capacity. Thus, there was little purpose in expanding capacity if it could not be used because of the extended periods of production quotas. Furthermore, I conjecture that a measure of complacency also played a role. Life with the cartel was so good that capacity expansion was not felt to be urgent, even in periods when quotas were not in force. A wave of nationalisations swept over the oil industries in OPEC countries during the 1970s, and state ownership continues to dominate. This has obviously facilitated coherence of market interventions by the cartel's governments, including measures to constrain capacity growth. At the same time, a majority of the state-owned firms in all exhaustible resource industries

including oil, both within and outside OPEC, have exhibited an extended record of inefficiency and, in particular, an inability to undertake investments in capacity expansion (Radetzki, 1985). Furthermore, the government owners have often depleted these firms financially for the benefit of the public budget, leaving insufficient resources for investments in expansion (Radetzki, 2008b). The scope for action by the private international oil firms, eager and able to develop new deposits, has been constrained by limited access to resources, caused by the fact that some 90% of the world's conventional oil deposits are controlled by governments (*Economist*, 2006). These circumstances, in combination with the conscious cartel efforts to extract monopolistic prices, explain the slow growth of capacity and the loss of OPEC's market share, documented in Table 1.

Figure 5 Commodity price indexes in constant dollars, 1950=100



Note: 1 UN's Index of Manufactured Exports in US \$ is used as deflator.

Sources: Statistics issued by IMF, UNCTAD, United Nations, World Bank.

Figure 5 provides circumstantial evidence of OPEC's monopolistic influence on prices. It depicts the price indexes in constant money of metals and minerals and of oil since 1948. Cutting off what happened from 2004 and onwards during the strong commodity boom, the figure clearly reflects the tendency of long-run price decline discussed earlier in this chapter, in the metals and minerals series. Oil prices, too, depict this decline until 1974, when OPEC took market command. Since then, the two series separate, the one for oil characterised by wild swings and, importantly, by index numbers of prices that average about twice those recorded by minerals and metals. Rising oil production costs cannot explain the differences in price performance. Oil has been hugely profitable to most oil producers, including all those located in OPEC nations, as well as to the

governments of the countries where it is produced, even in the 'low price' 1990s. A far more plausible explanation of the discrepancy between the metals and minerals and the oil price series is that the cartel's explicit or implicit activities ever since 1974, when it sprang to action, have kept the latter price well above the level that would have prevailed in the absence of producer collusion.

7 High dependence on exhaustible resource production and exports: blessing or curse?

Traditional wisdom asserts that nations richly endowed with minerals are fortunate. Such deposits are valuable assets whose exploitation can convert dormant mineral wealth into economic development and rising social welfare (Davis and Tilton, 2005). This positive view has been questioned in a number of empirical studies, suggesting that the exploitation of a rich mineral endowment tends to yield Dutch Disease that hampers diversified economic development, and the Resource Curse, resulting in slower economic growth.

The term Dutch Disease was first coined in the late 1970s to describe the stagnation and shrinkage of manufacturing as a consequence of the bonanza experienced by the Netherlands after the opening up of its natural gas deposits to highly profitable exploitation. The macroeconomics of the disease are instructively explored by sub-dividing the national economy into three sectors (Corden, 1984) - (a) the booming resource sector; (b) the sector where other tradeables (manufactures, food) are produced; and (c) the sector for non-tradeable goods and services.

The earnings from the profitable resource exploitation invariably increase demand for the output from the other sectors. Tradeable prices are determined outside the country, so are not affected by its resource bonanza. In contrast, the supply of non-tradeables is limited by the domestic production capacity, so their price will rise as demand expands. The shift in relative prices between tradeables and non-tradeables makes domestic production of tradeables less attractive. Hence, domestic output stagnates and is replaced by imports. The tradeable sector is further squeezed as the booming resource activity bids up labour costs and other input prices. In the absence of the booming resource activity, increasing costs throughout the economy would weaken the current account and force through a devaluation. This would restore the international competitiveness of the tradable sector. With the resource bonanza, exports develop strongly with a tendency for the currency to appreciate, further compromising the tradeable sector's ability to hold its own.

The ultimate result is a withering of domestic tradeable activities, along with an increasing dependence on the booming commodity and on imports. The nation subject to the Dutch Disease tends to become a true mono-economy. The

problems with this will be quite bearable if the bonanza perpetuates. In practice it often does not, and it may end with a bang.

The gist of policy to avoid the disease is suppression of the resource sector and support for the expansion of other sectors. Economic purists may well assert that the Dutch Disease is not a disease, that it simply involves an optimal allocation of resources towards the most rewarding activities, and that activist government intervention to prevent such allocation is uneconomic and undesirable. That view, of course abstracts from the inflexibilities and frictions that always characterise real economies, and especially underdeveloped ones. But even when inflexibilities and frictions are taken into account, it would be unwise to disregard the potential provided by the bonanza income for increased national welfare. Or that the added income could be sterilised by establishing a sovereign wealth fund that provides for a rainy day.

Yes, Dutch Disease can cause serious economic dislocations. And yes, it can be avoided by cutting any tendencies for a resource boom in the bud. But it is hard to imagine a government that would make such a choice. The temptations and potential benefits of a resource boom are simply too valuable to be missed.

A number of research papers published in the 1990s and 2000s (eg Sachs and Warner, 2001 and several predecessors by the same authors; Gylfason, 2001) asserted with increasing conviction that nations heavily dependent on exhaustible resource industries regularly suffer from a Resource Curse. The prime manifestation of this curse is slower economic growth than that experienced by countries at corresponding levels of economic development but with poorer resource endowments. The Resource Curse has commonly been attributed to institutional failures in resource-rich countries (Mehlum, Moene and Torvik, 2006; Sala-i-Martin and Subramanian, 2003).

More recently, these assertions have been questioned and the slow growth recorded in the data is increasingly regarded as a statistical aberration (Alexeev and Conrad, 2009; Boyce and Emery, 2011;

Davis 2011). According to the new credo, the slow economic growth may well be in the data, but the observation that the resource-rich nations regularly exhibit an elevated level of per capita GDP as compared with their peers is often not elucidated. For a proper appreciation of what goes on, it is necessary to note that the time path of growth in exhaustible resource dependent nations is characterised by a very speedy first stage, during which the resource sector is opened up. An elevated level of per capita GDP is reached during this stage. The growth of the maturing resources sector then decelerates and may eventually stagnate as depletion gains force. Compared to countries at a corresponding level of development but without resource wealth, economic growth in the resource-rich nations will appear to be slow during these later stages.

The time series from which the Resource Curse has emerged have apparently failed to take sufficient account of the first dynamic resource development stage during which per capita GDP is speedily raised. So, upon further reflection, the Resource Curse may not be a curse, after all.

Institutional development tracks general economic development. Nations at higher levels of GDP per capita have ordinarily more developed institutional frameworks than poorer nations. The observation of deficient institutional development in resource-rich nations can be interpreted not as a consequence of resource dependence *per se*, but simply as a lag where institutions have failed to improve at the speedy rate of GDP growth in the first stage of resource dependent development.

With these insights on the nature of Dutch Disease and the Resource Curse, it is hard to claim that exhaustible resource dependence constitutes a general trap, preventing progress.

Large-scale mineral and fossil fuel resource production has contributed substantially to the economic development of Australia, Canada, Chile, Norway, Sweden and the US. Such production still holds a prominent place in these prosperous nations. This suggests that a heavy concentration on exhaustible resource production is not detrimental *per se*. Diversification out of resource-related activities that have lost their competitive advantage is certainly warranted. But it is hard to find tenable arguments for diversification out of resources whose exploitation remains economically highly rewarding.

8 Summary observations

The long-run price in competitive markets for exhaustible resources should correspond to the total cost of the marginal production needed to satisfy demand. Numerous investigations have been undertaken to identify the trend in real exhaustible resource prices. Contrary to assertions of classical economists who saw depletion and accentuated scarcity resulting in rising price levels, the weight of evidence suggests that, on average, prices are declining. Falling transport costs, low income elasticity resulting in limited demand growth and stronger competitive forces than in markets for manufactures have been cited as explanations for this counter-intuitive evidence.

The absence of observable depletion signals in exhaustible resource market prices could additionally be due to an exceedingly ample resource wealth, upon which exploitation until the present has had only an imperceptible impact. Alternatively, the reason could be a downward bias in the manufactured price trends against which raw materials prices are measured, caused by an underestimation of

manufactured quality improvements. Rising long-run exhaustible resource prices in real terms could well emerge when this bias is removed.

Short-run exhaustible resource prices exhibit a high degree of instability. The dominant reason is typically low price elasticities, so that even small changes in demand or supply yield strong price reactions. The low level of demand elasticity is caused by a relative insensitivity to price by manufacturers, given that raw material costs constitute but a small share of the total cost of their output. Disturbances in supply due, for example, to strikes or technical accidents result in large price moves, especially when production capacity is in full use and the supply schedule turns vertical. Adjustments in capacity are time consuming and, in the meantime, an initial upward price disturbance will prevail. Shock absorbers in the design of macroeconomic policy are warranted to reduce the impact of this instability in countries heavily dependent on mineral and fossil fuel exports.

The long-run trends in exhaustible resource prices are occasionally interrupted by booms that raise the quotations for broad groups of raw materials to excessive and unsustainable levels. The booms are regularly triggered by an unanticipated acceleration in demand. Historically, a majority of the high price periods has been relatively short, and has been punctuated by a recession that cut the level of demand. The boom that started in 2003 is somewhat unusual in that it continues to persevere in 2011, fuelled by an uninterrupted growth in demand from the major emerging economies. The high prices have triggered an intensive investment activity to expand production capacity, and the boom will certainly end once that capacity is in place.

The current commodity boom has been coincidental with huge inflows of 'speculative capital' into commodity markets, most prominently in the form of 'Commodity Index Funds'. This has aroused strong beliefs that the financial inflows have been responsible for the sharp price increases and the accentuated price instability that have characterised the boom. Both private agents and public authorities have voiced the need for additional regulation of commodity markets to avoid the 'damaging' effects of speculation. In fact, however, available data needed to clarify the association between financial inflows and commodity prices are incomplete and of inferior quality, so the results of the empirical studies on the subject undertaken so far must be regarded as highly tentative. Furthermore, a majority of such analyses point to a very weak relationship between the factors under review. A better understanding of the role of financial inflows and speculation is clearly needed before the launch of new regulatory measures that risk the smooth functioning of commodity markets by reducing liquidity.

Most exhaustible resource markets operate under reasonably competitive conditions. This view is vindicated by the numerous failed attempts by producers to manage the market and raise prices. Examples in the period since the Second World War comprise bauxite, phosphate rock, uranium, copper and iron ore. In

all cases, collaboration and prices collapsed after only a few years. Substitution, insufficient market share and a lack of trust within the collaborating group are the major reasons behind the failures.

Oil is exceptional in that a price-raising cartel has successfully persevered for almost 40 years. Control over an extraordinary resource base has been of the essence for OPEC's success at market management, and its ability to extract monopolistic prices over this long period. Restrained capacity growth has been the key policy instrument, and its effectiveness has largely depended on the 'geological anomaly' of the Middle East-North Africa region, whose OPEC members possess no less than 60% of global oil reserves, including the ones that are most economical to extract.

A rich exhaustible resource endowment is not necessarily an unquestioned blessing to the nation possessing it. The Dutch Disease, immiserising other sectors in the economy as profitable resource exploitation starts to dominate the economy, and the Resource Curse, reducing the economic growth of nations that rely heavily on resource exploitation, are seen as two serious detriments of resource-dependent development. These negative views of the consequence of resource exploitation pose a serious dilemma to a richly endowed nation: Should it refrain from highly profitable activities just to avoid the detriments? The dilemmas appear to be resolved in some measure in the most recent research on the subject. The income earned from resource exploitation should be more than adequate to resolve Dutch Disease dislocations, while simultaneously providing for high general welfare levels that would be unattainable without that income. And on closer examination, the Resource Curse appears to be a statistical aberration. With these results, it is hard to claim that dependence on exhaustible resources exploitation constitutes a trap to desirable economic progress.

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4 Price Effects of International Cartels in Markets for Primary Products

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Introduction

Economists and other social scientists have debated the issue of the terms of trade between rich and poor nations for many decades. The principal focus of this debate has been whether the trade and direct investment public policies of the nations that were the first to industrialise have held back the growth and development of low-income countries. Later, concerns were expressed about whether the private market power of multinational firms might also have deleterious effects on economic development. For example, Connor (1977) found that US multinational manufacturers located in Brazil and Mexico had achieved substantial levels of market power and profits, though their profits were no higher than they enjoyed in their domestic markets.

More recently, various studies have addressed the issue of the potential exploitation of buyers from international cartels in low-income countries (Clarke and Evenett, 2003; Levenstein and Suslow, 2003). These latter studies find evidence that international cartels, primarily populated by firms headquartered in industrialised nations, cause prices to rise above competitive levels for buyers in developing countries. Moreover, because anti-cartel laws are absent or poorly administered, the negative welfare effects on customers in developing countries are proportionately greater than customers in high-income countries.

This chapter extends this strand of the international cartel literature. The major objective of this chapter is to assemble and analyse the extent of price changes induced by privately organised international cartels that monopolised markets for primary products.

Two original datasets will be employed to address this goal. These data will permit the analysis of fairly large samples of several categories of primary-product cartels, mostly ones that were discovered by antitrust authorities during 1990–

2010. I will examine price effects over several industries, geographic regions, and time periods. These data link the economic harm generated by these cartels to the monetary penalties imposed on them by antitrust authorities, an exercise that will reveal the degree of deterrence of cartel violations presently achieved. I believe that the present chapter offers a uniquely detailed perspective on the impact of international cartels on the less developed economies of the world.

Some observations on the changing roles of competition-law enforcement will be offered. Long dominated by enforcement agencies in North America and Western Europe, these data will show that, though a fairly recent phenomenon, antitrust authorities of many middle-income nations are becoming significant sources for the detection and disbanding or punishment of cartels.

Definitions

This chapter focuses on *private international hard-core cartels*. Private cartels are voluntary associations of legal entities – usually large multinational corporations – that explicitly collude on the control of market prices or output with the aim of increasing joint profits of its members. Many government-sponsored international commodity agreements, such as OPEC, are not classified as private collusive schemes. Moreover, mandatory price-fixing arrangements, like USDA marketing orders, do not qualify as private cartels. Because private cartels (comprised mostly of corporations or corporate associations) are not protected by sovereign treaties, they are subject to price-fixing sanctions under the antitrust laws now adopted in a hundred nations of the world.

‘International’ cartels are those with members headquartered in two of more nations. Thus, international is a membership concept and not necessarily a geographic concept. International cartels tend to be larger, better publicised, more injurious to markets, and geographically more widespread than the many more numerous local cartels. Many international cartels are virtually global in their operations.

‘Hard-core’ describes agreements that are knowingly made through some sort of direct communication among the cartelists about controlling market prices or reducing industry output.¹ In many jurisdictions cartel formation is a conspiracy.² Before cartels were made illegal, the association would be established by a written contract that in many nations were enforceable by courts; historical cartels often

1 Cartels are one type of horizontal restraints of trade. Only cartels that overtly agree to control prices, output or both are ‘naked’ or ‘hard-core’ violations. An agreement that, for example, illegally restricted access to a trademark would not be considered a serious, hard-core violation. In some jurisdictions, cartels are criminal violations, whereas other types of restraint of trade are civil violations.

2 Both the United States and the EU have adopted the conspiracy theory of cartel infringement. As such, it is the agreement that is the violation, not whether the market or customers were injured. Agreements usually involve verbal conversations (containing the words ‘agree,’ ‘deal,’ ‘let’s do it,’ ‘contract,’ or other synonyms) or handshakes, but may include more subtle body language.

had a secretariat registered in Switzerland, London, or some other convenient business centre. The business press of the day would follow developments of cartels and report on them. Nowadays, cartels generally are founded through face-to-face meetings, make oral contracts only, and keep their existence secret. Operational decisions are handled by a management committee that meets at least annually, and disputes are resolved through frequent telephone calls, faxes, or emails between meetings.³

The definition of 'primary products' starts with raw materials, *ie* unprocessed products from agriculture, fishing, forestry, petroleum extraction, and coal and other mining industries). I also include first-stage processing of raw materials by including selected manufacturing industries, namely processed foods and food ingredients, beverages, tobacco, wood, textiles, fertilizers, agricultural chemicals and primary metals.⁴ Note that the remaining manufacturing industries are relegated to the 'secondary products' category. Secondary product manufacturing typically requires either raw materials or primary manufactures as inputs for further value-added transformation. To be precise, 'other manufacturing' includes furniture, clothing, many non-agricultural chemicals, refined petroleum products, many producer intermediate inputs, capital goods, and a wide array of consumer manufactures. Secondary goods also include all service-sector industries.

Price and output effects of cartels are generally measured by comparison to equilibria observed in perfectly competitively structured markets, but other methods use various 'non-cooperative' oligopolistic equilibria as the appropriate benchmarks. The Cournot model is an example of the latter. Sellers' cartels generally aim to raise prices and/or reduce supply relative to the benchmark market outcome. Although less common, buyers' cartels attempt to force down the prices members pay for inputs purchased. In either case, there are measurable welfare losses imposed on buyers or sellers of cartelised products.

In the present chapter, price effects will be measured with the cartel *overcharge*, which can be expressed as a price difference, a percentage, or a monetary figure. If P_m is the observed market transaction price during a collusive period and P_c is an appropriate competitive benchmark price during the same period, then the Cartel Overcharge $CO = P_m - P_c$. Expressed as a percentage price change:

$$CO = ((P_m - P_c)/P_c) \cdot 100\%.$$

³ These activities then leave a paper or electronic trail that is later used by prosecutors.

⁴ There is no standard definition as to what comprises primary products. I thank Frederic Jenny for suggestions about which industries to include under this rubric. Primary-product industries have historically often been found in low-income countries near the mines, forests, plantations, etc. that supply raw materials.

The cartel overcharge is directly related to the familiar Lerner Index of market power.⁵

When the percentage *CO* is multiplied by the cartel's revenues, this total overcharge becomes a measure of the *economic harm* imposed on a cartel's customers. It is a Marshallian welfare loss, a transfer of income from customers to the members of the cartel. Under US law and the laws of many other nations, the total overcharge is a compensable harm or *damages*.⁶ In addition, when a cartel successfully overcharges its customers, a deadweight social loss is created, though this is not generally considered a compensable harm.⁷

Data sample and sources

This chapter will draw upon two extensive datasets that have been continuously developed for more than ten years. Both have been employed in scores of working papers, peer-reviewed academic journal papers, and policy analyses.

First, the *Price-Fixing Overcharges* (PFO) data set is a sweeping collection of more than 2,000 published, quantitative estimates of the price changes (if any) caused by private cartels that began to operate as early as 1700.⁸ The majority of the observations are drawn from economists' empirical studies about cartels and bid-rigging schemes discovered and punished by antitrust authorities in the past few decades.⁹ Although broad in coverage, these data include only certain basic information about each of the 1100 episodes. A limitation of this data set is that it is not a sample of all cartels mentioned in the published literature, but only cartels for which price effects are known.

5 The Lerner Index is also computed by starting with overcharge $Pm - Pc$, except that the Lerner Index is measured by dividing the overcharge by the monopoly price instead of the competitive price. That is, the Lerner Index is a margin on the collusive selling price, while the overcharge is a *mark-up* on the competitive price. Thus, for the same cartel the Lerner Index is a smaller number than the overcharge ratio, though the differences are small for small overcharges. Both indexes are zero when markets are competitive; for a pure monopoly, the Lerner Index is unity and the *CO* is a large number.

The Lerner Index is $L = (Pm - Pc)/Pm$. Simple algebraic substitution allows one to express *CO* as a function of *L*, viz, $CO = L/(1 - L)$. Alternatively, $L = CO/(CO + 1)$.

6 In fact, direct purchasers are entitled to treble damages under US law, though in practice less than single damages are usually awarded. In most Common Law nations and many other jurisdictions single damages may be sought in private suits (see Foer and Cuneo, 2010).

7 Deadweight losses are difficult to calculate, but Lande and Connor (2012) conclude that they typically range from 6% to 20% of a cartel's overcharges.

8 *Cartel Price-Fixing Overcharges: Master Data Set*. A proprietary spreadsheet first created about 2002 and continuously revised and expanded. The *Master Data Set* spreadsheet in May 2011 consists of 2,116 observations of cartel price effects from 1,234 cartel episodes. I employ a sub-set of 688 *international* episodes in this chapter.

9 For an analysis of these data, see Connor (2010).

Second, the *Private International Cartels* (PIC) data are a more richly detailed legal-economic compilation on about 600 international cartels punished by antitrust authorities worldwide during 21 years: January 1990 to December 2010.¹⁰ It includes cartels with and without overcharges data. The PIC data include details on the sanctions imposed by courts and commissions worldwide. Almost all of these cartels had only one known episode.

Industry distributions of cartels

In this section, I examine the industry distribution of cartel episodes, paying particular attention to the share of primary-product industries that were cartelised.

The distribution of cartelised markets is shown for four historical periods in Table 1. Primary-product markets are a large share of cartelised markets before 1945.¹¹ They account for 45% of the total cartel episodes in the era before 1920, 73% in the interwar period,¹² and 66% in the 44 years after WWII. Mining, crude fertilizers and primary metals account for the lion's share of the cartelised primary products. No cartels have been observed in the textile and wood industries.

However, in the past 21 years (1990–2010), the primary-product share drops precipitously to 16%. One may speculate that fewer primary-product cartels were discovered in the agriculture and mining sectors because those sectors have shrunk as a share of the world economy; similarly, the growth of the service sector may be partly responsible for the rise in secondary product cartels. But sectoral shifts in the world economy do not explain the overwhelming share (80%) of cartels found in the manufacturing sector in 1990–2010.

10 *Private International Cartels: Full Data*. This spreadsheet, first created ca 1998, is continuously updated with a rich assortment of legal and economic data on cartels discovered since 1990. As of mid-2011, the Full Data spreadsheet consisted of observations of 639 suspected and convicted cartels and 6000+ cartelists (companies and individual participants).

11 Not much should be made of the changes in total numbers of cartel episodes. These vary as much perhaps because of the interest of economists or enforcement activity than because of actual cartel numbers. These factors may also be responsible for severe underreporting (until the past decade or two) of cartels based in the LDCs; the rise in the quality and quantity of industrial-economics scholarship and of more aggressive antitrust enforcement has already made a sea change in the number of cartel studies origination in LDCs and middle-income countries.

12 A well-regarded study of the interwar cartels confirms the fact that primary products dominated cartelisation (Stocking and Watkins, 1946, 1948, 1951).

Table 1 Number of known international cartel episodes, by industry, 1700–2010

Industry	Year episode ended				Total
	1702–1919	1920–1945	1946–1989	1990–2010	
Primary	33	130	42	60	265
Agriculture & forestry	0	5	0	0	5
Mining	8	41	17	0	63
Food & tobacco	0	8	1	13	22
Textiles	2	0	0	0	2
Wood, lumber	0	0	0	0	0
Chemical fertilizers	10	23	8	42	83
Primary metals	13	53	16	5	87
Other industries	40	49	22	312	423
Other manufacturing	37	48	22	238	345
Construction	0	0	0	13	13
Transport & communication	2	1	0	19	22
Distribution	0	0	0	11	11
Other services	1	0	0	31	32
All industries	73	179	64	372	688

Source: J M Connor, Price-Fixing Overcharges data spreadsheet dated 4 May 2011.

The dominance of manufactures and secondary products in the 1990–2010 period is confirmed by the PIC data set, which does not require the availability of an overcharge estimate as a criterion for sample selection (Table 2). In fact, the share of the 612 cartels operating in primary industries is, like the PFO data, also 16%. The absolute number of cartels in agriculture, mining, and food and tobacco processing appears to be at an historic high. The large number of food-product cartels in the 2000s appears to have been the result of the widespread use of antitrust investigations to attack price inflation of basic foodstuffs. Cartel members will oftentimes point to real or imaginary increases in input costs as justification to the public and competition authorities of sharp price increases. Examples of successfully prosecuted cartels of this type include the EU's French beef, Spain's vegetable oils, South Africa's bread and flour, Italy's pasta, and Germany's two coffee cases.

Table 2 Number of international cartels detected, by industry, 1990–2010

Industry	Year episode ended		Total
	1990–1999	2000–2010	
Primary:	21	78	99
Agriculture & forestry	2	8	10
Mining	1	9	10
Food & tobacco	9	36	45
Textiles	1	4	5
Wood, lumber	0	3	3
Chemical fertilizers	8	12	20
Primary metals	0	6	6
Other Industries:	134	379	513
Other manufacturing	91	187	278
Construction	12	28	40
Transport & communication	12	57	69
Distribution	10	50	60
Other services	9	57	66
All industries	155	457	612

Source: J M Connor, Private International Cartels data spreadsheet dated 21 June 2011.

Geographic distribution of cartels

The PFO data permit only counts of the location of operation of 677 cartel episodes classified into six broad geographical categories: North America (excluding Mexico), single nations of Western Europe, EU-wide (multiple member states of today's EU27), Asia (including Oceania), Global (two or more continents), and all Other (Africa, Latin America and Eastern Europe).¹³ Only Asia and Other are comprised of largely low-income countries. While some operated solely across North America and Western Europe, for the large majority of *global* cartels low-income nations' prices were also affected. For these reasons, I will examine a sub-total of three 'regions' (Asia, Global, and Other) as an indicator of whether cartels affected the economies of low-income countries and territories.

Table 3 shows the PFO data's geographic distribution of cartel operations. The main finding is that on average over the last 310 years fully 47% of all international price-fixing episodes have affected prices in LDC territories. This ratio was highest

¹³ In some cases, the early episodes of a cartel and the later episodes may be in different categories. For example, a cartel that first grew up in Europe might later have evolved into a global cartel.

(79%) in the interwar period when global cartels first began to flourish and was much below average (27%) in the most recent period 1990–2010.

Table 1 Number of known international cartel episodes, by principal geographic region of operation, 1700–2010

Industry	Year episode ended				Total
	1702– 1919	1920– 1945	1946– 1989	1990– 2010	
North America	17	28	9	142	196
EU (multiple member states)	4	9	11	69	93
Single nations of W. Europe	1	0	7	59	67
Global (2+ continents)	39	142	36	67	284
Asia & Oceania	0	0	1	19	20
Other less developed regions ^a	1	0	0	16	17
World (all regions)	62	179	64	372	677
	% of world				
Asia, and LDCs	1%	0%	1%	9%	5%
Global, Asia, and LDCs	65%	79%	58%	27%	47%

Source: J M Connor, Price-Fixing Overcharges data spreadsheet dated 4 May 2011.

Notes: a) Includes episode entirely within Africa, Latin America or Eastern Europe.

While there may be several explanations of why the LDCs were more affected by cartel activity prior to 1945 than after 1989, there are two factors that I believe offer the greatest possible explanatory power. First, the frequency of global cartels drives most of the variation in the LDC share. Most global cartels were discovered and investigated first by either the DoJ or the EC. Prior to 1990, only 2 episodes out of 305 were located in the four regions most associated with low incomes (Africa, Asia, Latin America and Eastern Europe). A large proportion of the global cartels were founded by companies headquartered in Western Europe in countries with strong trading ties with their colonies. Moreover, until the rise in the 1960s of Japan as a strongly competitive industrial economy (and other Asian Tigers since then), there were no local firms to countervail against the power of these global cartels.¹⁴ It is noteworthy that most global cartels active since about 1990 have avoided trying to fix prices in the highly competitive Chinese manufacturing sector.

The second factor is the spread of antitrust laws and effective antitrust enforcement. At the time when the European Commission began fining cartels for the first time in 1969, there were only three national antitrust authorities

¹⁴ Later on beginning in the 1980s, companies from Japan, South Korea and Taiwan would join many global cartels rather than remaining on the competitive fringe.

with effective anti-cartel laws: the United States, Germany and Japan. It is fair to say that, possibly apart from Japan, significant anti-cartel enforcement was absent in low- and middle-income countries until 10 or 15 years ago (Connor, 2008, 2009). Today, more than 50 authorities have investigated or sanctioned international cartels, and South Korea, Brazil and South Africa are among the many LDCs with active enforcement regimes. That is the main reason cartels are being discovered that have fixed prices solely within the jurisdictions of LDCs.

Table 4 contains information about the whole sample of contemporary international cartels from the PIC data set, which allows one to chart the geographic spread of cartel operations using affected sales¹⁵, a much more precise measure than counts of episodes. In particular, these data permit the partitioning of sales of global cartels across regions, something the PFO data cannot show.

Table 4 Affected sales of all international cartels detected, by geographic region of activity, 1990–2010

Region of operation	Cartels <i>Number</i>	Total sales <i>Million US dollars</i>	Sales <i>% of Total</i>
Single low- & middle-income nations:			2.9
Africa:	16	109,685	0.8
Egypt	2	22,900	
South Africa	13	86,766	
Zimbabwe	1	19	
Asia:	37	201,849	1.5
Indonesia	4	17,621	
India	3	825	
Korea, South	21	167,639	
Kazakhstan	1	12,239	
Pakistan	2	1303	
Philippines	2	223	
Timor Leste	1	0.2	
Taiwan	2	1995	
Vietnam	1	4	
Eastern Europe:	28	22,041	0.2
EU Eastern European member states	27	18,536	
Russia	1	3,505	

¹⁵ Affected sales data are available for a sub-sample of 456 of the 612 international cartels, or 75% of the full data set. However, because sales of the largest cartels are somewhat better reported than smaller cartels, I suspect that the sub-sample represents more than 80% of the total sales.

Region of operation	Cartels Number	Total sales Million US dollars	Sales % of Total
Latin America:	11	52,294	0.4
Argentina	1	3,700	
Brazil	7	38,811	
Chile	1	1	
Mexico	2	9,782	
Multiple low- & middle-income nations:			15.5
Global cartels ROW:^a	109	2,096,267	15.5
Africa sales (estimated)	?	141,696	
Asian sales (estimated)	?	1,550,736	
Latin American sales (estimated)	?	403,834	
Single high-income nations:			45.2
Asia and Oceania:	18	31,144	0.2
Israel	4	3,325	
Japan	5	12,366	
Australia & New Zealand	9	15,453	
Western Europe:	115	2,553,900	18.9
EU Single Western European member states	115	2,553,900	
North America:	52	3,539,957	26.1
Canada	9	6,811	
United States	43	3,533,146	
Multiple high-income nations:			36.8
Global cartels:	109	2,087,667	15.4
US	91	1,028,677	
Canada	72	68,521	
EU-wide	89	923,030	
Single EU member states	13	67,066	
Switzerland	2	373	
Continental cartels:	66	2,897,915	21.4
EU-wide	55	2,869,089	
USA & Canada	11	28,826	
All regions	456	13,541,729	100.0

Source: J M Connor, *Private International Cartels* data spreadsheet dated 21 June 2011. Total of 456 cartels with sales data; a few are under investigation and not yet convicted.

Notes: ? = Uncertain. a) Partitioned ROW sales across the three continents according to 2009 GDP.

From the point of view of consumers in the LDCs, the good news is that cartelists – overwhelmingly headquartered in rich countries – primarily exploit their compatriots. Specifically, only about 18% of the worldwide sales of international cartels in the past 21 years have occurred in low- and middle-income countries. And of that 18%, only about one sixth was generated by cartels that operated exclusively in a single low-income nation. The remaining five sixths of cartel sales in less developed regions was the result of price-fixing by *global* cartels.

Table 5 compiles data on the geographic distribution of cartels and their affected sales for 86 primary-product cartels only. The distribution of sales for primary products is similar to that in Table 4 for all international cartels except that cartel activity is even more tilted toward the high-income countries. Only about 6% of the worldwide sales of international primary-product cartels in the past 21 years have occurred in low- and middle-income countries, of which only about one tenth was generated by cartels that operated exclusively in a single low-income nation. The remaining 90% of cartel sales in less developed regions was the result of price-fixing by *global* cartels.

That the harm caused in the LDCs by international cartels is primarily caused by global-type cartels is a cause for great concern because of the peculiarly harmful characteristics of global cartels (Connor, 2007). In brief, global cartels are known to generate relatively high overcharges and display greater longevity than all other types of cartels. Also, I suspect, but cannot prove, that global cartels are more difficult to detect than other types.¹⁶ The data displayed in Table 4 show that uniquely for global cartels, half of their operations impact customers in high income nations and half in the LDCs. These facts suggest that only a coordinated and focused effort by multiple antitrust authorities will be effective in stamping out these especially harmful cartels. It is in the interests of competition authorities in the rich countries to make the detection of global cartels a high priority not only because it benefits their own citizens, but also because it can make real contributions to the economic development and welfare of the residents of low-income regions. It also offers a rationale for wealthy countries to subsidise extensive funding of training programmes for LDC competition authorities' staffs.

¹⁶ I suspect this is the case because global cartels tend to be populated with higher proportions of recidivists than other types of cartels. One would expect companies prosecuted for multiple price-fixing violations to have developed superior skills in detection-avoidance.

Table 5 Affected sales of primary-product international cartels detected, by geographic region of activity, 1990–2010

Region of operation	Cartels <i>Number^b</i>	Total sales <i>Million US dollars</i>	Sales <i>% of Total</i>
Single low- & middle-income nations:			0.7
Africa:	11	25,312	0.5
Egypt	0	0	
South Africa	11	25,312	
Zimbabwe	0	0	
Asia:	5	5,282	0.1
Indonesia	0	0	
India	0	0	
Korea, South	2	5,282	
Kazakhstan	0	0	
Pakistan	2	?	
Philippines	0	0	
Timor Leste	0	0	
Taiwan	0	0	
Turkey	1	?	
Vietnam	0	0	
Eastern Europe:	2	752	0.0
EU Eastern European member states	2	752	
Russia	0	0	
Latin America:	1	590	0.0
Argentina	0	0	
Brazil	1	590	
Chile	0	0	
Mexico	0	0	
Multiple low- & middle-income nations:			5.2
Global cartels ROW:^a	7	255,539	5.2
Africa sales (estimated)	?	17,273	
Asian sales (estimated)	?	189,038	
Latin American sales (estimated)	?	49,228	
Single high-income nations:			34.3
Asia and Oceania:	2	95	0.0

Region of operation	Cartels Number ^b	Total sales Million US dollars	Sales % of Total
Israel	1	95	
Japan	0	0	
Australia & New Zealand	1	?	
Western Europe:	31	1,649,834	33.5
EU Single Western European member states	31	1,649,834	
North America:	7	38,305	0.8
Canada	3	1,275	0.0
United States	7	38,305	0.8
Multiple high-income nations:			59.7
Global cartels:	7	421,960	8.6
US	7	157,170	3.2
Canada	7	11,985	0.2
EU-wide	7	249,805	5.1
Single EU member states	1	3,000	0.1
Switzerland	0	0	0
Continental cartels:	10	2,518,924	51.1
EU-wide	15	2,500,807	50.7
USA & Canada	3	18,117	0.4
All regions	86	4,930,367	100.0

Source: J M Connor, *Private International Cartels* data spreadsheet dated 21 June 2011. Total of 456 cartels with sales data; a few are under investigation and not yet convicted.

Notes: a) Affected sales are usually available for N America and Europe, so ROW is a residual value. Partitioned ROW sales across the three continents according to 2009 GDP. b) Number with or without sales data.

Price effects of cartels

I compute averages from data on overcharges from the two datasets at my disposal. First, the PFO data indicate that the typical international cartel had a median¹⁷ overcharge of 30% over the entire time period 1700–2010 (Table 6). Interestingly, average overcharges declined significantly during the 310-year period, from 58% before 1920, to 33% during 1920–89, to 25% since 1989. This downward trend has been verified in a study that employs econometric methods (Connor and Bolotova, 2006). A secular decline is evident in both for cartels in

¹⁷ I use the median rather than the mean average because episodic overcharges are highly negatively skewed. The median includes about 7% of the sample with zero overcharges. Overcharges of international cartels are several percentage points higher than domestic cartels.

secondary products but not for primary-product markets. The decline in overall cartel overcharges appears to reflect more effective anti-cartel enforcement over time; there is little evidence that changes in methods of analysis are responsible for the trend.

Table 6 Average price effects of known international cartel episodes, by industry, 1700–2010

Industry	Year episode ended				Total
	1702– 1919	1920– 1945	1946– 1989	1990– 2010	
	Median % overcharge				
Primary:	53.3	29.0	42.5	33.3	36.0
Agriculture & forestry	–	128.5	–	–	128.5
Mining	52.5	28.0	43.2	–	42.7
Food & tobacco	–	13.5	10.0	35.4	29.0
Textiles	73.7	0.0	–	–	71.2
Wood, lumber	–	–	–	–	–
Chemical fertilizers	116.5	78.6	26.2	16.6	40.9
Primary metals	41.3	19.0	47.0	48.8	30.2
Other industries:	62.6	50.0	24.3	25.0	27.5
Other manufacturing	59.1	50.0	24.3	25.0	28.6
Construction	–	–	–	13.3	19.5
Transport & communication	54.5	53.5	–	17.5	17.5
Distribution	–	–	–	14.9	14.9
Other services	430.0	–	–	38.8	38.8
All industries	57.5	33.0	33.1	25.0	30.0

Source: J M Connor, *Price-Fixing Overcharges* data spreadsheet dated 4 May 2011.

Notes: - = Not available.

For the whole time period, average overcharges achieved by primary-product cartels are somewhat higher (36%) than for other products (28%), but this relationship holds in only two of the four sub-periods. The superior average profitability of primary-product cartels is seen in 1946–89 and 1990–2010. The high overcharges in primary products in the post-WWII era are strongly boosted by the relatively high overcharge generated by cartels in the mining and primary metals industries, whereas the lower overcharges in manufacturing and most service industries dragged down the average in secondary products in 1946–

2010. During the interwar era, secondary product cartels were considerably more effective in raising prices than were primary-product schemes. I can conjure no reasonable explanation for this temporal pattern.

Anti-cartel enforcement

The sub-periods chosen to display the cartel data correspond to analytically meaningful policy regimes. I see the early 20th century, the late 1940s, and the late 1980s as significant turning points in the global movement to control hard-core cartels. Prior to 1945, only the United States had a consistently enforced anti-cartel regime. However, it was not until 1907–11 that the DoJ began to win price-fixing cases in the courts. During the early 1930s, the US antitrust laws were in effect suspended. More importantly, the DoJ did not pursue international cartels until the late 1940s, so until then US firms felt free to join cartels operating offshore. Finally, the DoJ did not implement its productive amnesty programme or impose strong felony sanctions until the early 1990s.

Criminal anti-cartel laws were implemented shortly after WWII in Japan and Germany. After some early prosecutorial successes in Japan, the Fair Trade Commission lapsed into several decades of unimportance. While a new assertiveness has been in evidence in the past two or three decades, even today the Japan FTC sanctions very few international cartels. In Germany, aggressive anti-cartel enforcement did not begin until after the Diet debated the usefulness of competition laws in 1958. Cartels are not per se illegal in Germany, but the Federal Cartel Office is a European leader in prosecuting hard-core cartels, including many international ones.

The most important post-war milestone in anti-cartel enforcement was the civil competition law embodied in the Treaty of Rome. After a tentative beginning, the European Commission began to implement modern methods of cartel detection and to impose significant penalties in the late 1980s. By 1990 all of the EU's member states had implemented national competition laws that harmonised with that of the EU's practices and had established mostly competent, well-funded National Competition Authorities. By the late 1990s, without specific authority to do so, several NCAs had begun prosecuting large international cartels. After 2000, the EC and the EU's 27 NCAs had captured the lead in punishing such cartels. France, Italy, Germany, Italy, the Netherlands and some of the Nordic countries can point to tangible and accumulating records of success in defeating powerful cartels, some of them formed by state-owned enterprises.

Spurred by the downfall of central planning, the replacement of authoritarian with democratic governments, the formation of customs unions, and gentle nudges from jurisdictions proud of their antitrust traditions, the great majority of the world's low- and middle-income countries have adopted and funded

competition-law authorities. About 30 of these have already investigated or sanctioned hard-core international cartels. While most have had doubtful impacts on cartel deterrence, some are rising stars in the antitrust firmament. The anti-cartel campaigns of Brazil, South Korea and South Africa have been particularly aggressive in the past decade (Connor, 2008, 2009).

A goodly share of antitrust effort has been expended on cartels in primary-product industries. However, in some jurisdictions, food and agricultural industries have been relatively neglected. A recent policy analysis by the non-partisan American Antitrust Institute states that: 'Antitrust law enforcement over the past eight years has failed to deal effectively with either the substantial structural changes or the exploitative and exclusionary conduct manifest in both the input and output markets that farmers face'(AAI, 2007:282).

My latest survey of cartel penalties shows that while monetary price-fixing penalties continue to grow fast, they remain less severe than the overcharges as a proportion of affected sales (Connor, 2011). Cartel formation cannot be deterred in such a policy environment.

A final comparison of primary products with secondary products focuses on how severe the monetary sanctions of antitrust authorities and courts have been during 1990–2010. One measure of severity is the ratio of total penalties to the cartel's affected sales in the appropriate jurisdiction.¹⁸ The penalty guidelines for price-fixing violations followed by most government antitrust authorities start with some percentage multiple of affected sales, so this measure of severity is meaningful.¹⁹ While penalties are relatively straightforward to compile, affected sales for the entire collusive period is not often revealed by the authorities. Often, one year's affected commerce is mentioned in sentencing documents or posted decisions; combined with the duration of the cartel and growth rate assumptions, a relatively accurate estimate of affected sales can be computed. For some of the remaining cartels, if the product-market definition given by the authorities is sufficiently precise, the industries' sales can sometimes be inferred from industry trade publications, from consulting-firms' reports, or from academic studies of markets.

18 By total penalties I mean all criminal fines on companies and their officials, administrative fines on companies, and recoveries in private damages suits. Recoveries include compensatory payouts to victims, legal fees for plaintiffs' counsel and other plaintiffs' costs (such as claims administration) ordered by a court. I do not attempt to compute the opportunity costs of imprisoned cartel managers because of the many controversies surrounding such attempts (see Calvani and Calvani, 2011: 228–229).

A possible superior indicator of severity might be the ratio of penalties to cartel overcharges, but I judge that the number of such ratios for primary product cartels is insufficient to make any generalizations.

19 The U.S. DoJ follows guidelines that multiply affected sales by 20%; the EC's newer 2006 guidelines generally begin with 15% to 20% of sales; several other agencies begin with 10% to 15% of sales, but often truncate the period to one to three years rather than the whole period of collusion. In some jurisdictions, various adjustments are made for the defendants' degrees of culpability or cooperation with the authority, but the first step tends to overwhelm these later adjustments.

I am able to calculate the severity of antitrust penalties for 47 primary-products cartels. The mean and median averages are 7.6% and 2.2%, respectively. Obviously, there is a great deal of skewness²⁰ in these intensity ratios, so the median is a superior indicator of central tendency. There are 339 comparable intensity ratios available for punished cartels that supplied secondary products. The mean and median averages are 34.5% and 3.1%, respectively. Clearly, antitrust authorities are generally about 30% more lenient in penalising the participants of primary-product cartels than they are with secondary-product cartels. Why this difference in leniency should exist at all is rather puzzling, a puzzle that deserves further investigation.

Concluding comments

I believe that this chapter has laid out a number of previously undocumented empirical regularities about hard-core primary-product cartels and suggested some explanatory hypotheses for these patterns. First, the frequency of cartels in primary-product markets has declined markedly in recent years. Before 1990, about two thirds of all cartel episodes were in primary-product markets, whereas only about one eighth have been since 1990. Second, since 1990 only about 6% of the affected sales of primary-product cartels occurred in low-income countries, the vast majority of which is due to the operations of global cartels comprised mainly of multinational corporations. Global cartels impose higher percentage overcharges for longer durations than other types of cartels. Third, the overcharges of primary-product cartels are about 30% higher than the remaining secondary-product cartels. Fourth, despite what has been recited about the greater injuriousness of primary-product cartels, they are treated more leniently when being sanctioned by the world's antitrust authorities and civil courts.

The spread of effective antitrust enforcement regimes from perhaps three active jurisdictions in the 1980s to dozens today is a fascinating example of voluntary global policy harmonisation. Annual international cartel detections are 10 times higher today than they were 20 years ago, mainly because 50 antitrust authorities are now searching for them. About 30 competition-law authorities have imposed penalties on international cartels up to 2010. Yet, current fines and other penalties are not high enough nor are they often imposed outside North America and Europe to disgorge the monopoly profits of the typical private international cartel. Global antitrust penalties are not yet deterring the formation of new cartels. A good place to focus enforcement energies would appear to be on primary products.

²⁰ There were four cartels with ratios between 30% and 60% of sales; these high ratios were largely responsible for the exaggerated mean average. I re-examined the four cartels, but could detect no data errors. One was fined by the US DoJ, one by the EC, one by the Netherlands antitrust authority, and one by South Africa.

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5 Global Welfare Consequences of Cartelisation in Primary Commodities

Cases of Natural Rubber and Banana

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1 Introduction

Developing countries are rapidly increasing their share of manufactured trade. Their shares have been rising not just in labour-intensive products, but also in capital- and skill-intensive ones. However, manufactured exports remain highly concentrated with a few of these countries; most developing countries still depend on primary products for their export earnings. In some cases, commodities account for over 60% of their merchandise exports. Yet, the share of developing countries in the world export of primary products remains smaller than that of the developed countries (Table 1).

Table 1 Exports of primary products by region, 2009

Region	Share in regional exports (%)		Share in world exports (%)	
	Agricultural products	Mineral and fuel	Agricultural products	Mineral and fuel
North America	11.2	13.6	15.33	9.61
Latin America	30.5	38.2	11.95	9.27
EU	10.5	9.6	45.19	29.45
CIS	8.7	62.9	3.35	9.42
Africa	10.2	64.0	3.34	8.30
Middle East	2.6	68.0	1.55	14.2
Asia	6.3	10.8	19.29	17.8

Source: Based on WTO (2010)

In part, this could be attributable to anticompetitive practices of international and domestic export cartels (although restrictions on the trade of commodities in the form of licensing, quotas, export restrictions, tariffs, packaging regulations and other non-tariff barriers by developed countries may also contribute to the volatility of these markets (Jain *et al*, 2010)) Since the mid-1990s there has been a resurgence of interest in economic and legal studies of cartels, in particular international cartels. It is found that these cartels have had a large impact on the international trade of developing countries, and on developing-country consumers and producers (Bhattacharjea, 2004; Levenstein and Suslow, 2006; Levenstein and Suslow, 2003; Becker 2007). Aside from having developmental consequences outside their territories, export cartels have also been seen to impact domestic welfare by influencing domestic production and pricing decisions (see for instance Mehta and Nayak, 2011, for potash cartel). Operating such cartels in the home country can also create a potential situation of ‘conscious parallelism’ when sensitive price information is shared to set prices for foreign markets. Another domestic effect is the exclusion of competition between export traders. However, literature is not unambiguous about the effects of cartels. While one set of studies find cartels welfare-reducing, another set of studies come to the conclusion that they may enhance economic welfare under certain conditions. Whether cartels are socially desirable or not is thus an empirical question.

This study presents two illustrative case studies to show the impact of cartelisation in primary commodity markets. These are natural rubber and banana. While the former relates to the effects of cartels in a primary raw-material market, the latter is a case of cartelisation along the vertical chain and downward monopolistic pressure from the retail level. Over the past two decades, the control of the large players over the world’s food supply chains has increased tremendously at every stage of food production – from gene to market shelf (Mertaugh, 2003) – affecting the global markets considerably. John Connor in this volume reports 99 international cartels in the primary sector for the period 1990–2010. Of this, only 20 (3%) operate in raw materials, affecting 2.3% of sales in the sector, while the rest are in upstream and downstream sectors. Further, McCorriston, and Hoekman and Martin have discussed at length pertinent policy issues arising from cartels in vertically integrated primary commodity markets. A World Bank report estimated that divergence between producer and consumer prices may have cost commodity-exporting countries more than \$100 billion a year, and suggests that imperfect competition at the intermediary level – the international trading companies – is a key factor (Morriset, 1997). Against that backdrop, analysis of the two cases will provide useful insights on the effects of cartelisation in primary products’ trade.

The European Union stated in 2000 that export cartels ‘had a clear distortionary effect on international trade as well as a harmful impact on development on international trade as well as a harmful impact on development. Export cartel exemptions have been seen as the cause for a downwards spiral of

anticompetitive measures and counter-measures taken by governments and market participants' (Becker, 2007).

The cost of international and export cartels on developing countries has been studied by many scholars. Furthermore new evidence on the cost of export cartels for developing countries surfaces regularly. An example is the study of the potash cartel developed in Frederic Jenny's chapter of this book and which has been discussed by CUTS (Mehta and Nayak, 2011).

The chapter begins with analysing the global impact of existing export cartels in primary commodities. The subsequent section discusses two illustrative case studies to show how departures from competition and the presence of market power in the downstream markets for primary commodities are serious matters for global concern. To highlight the divergent scenarios that may exist in the raw materials market, the chapter attempts at two distinct analyses: the first one, dealing with natural rubber, studies horizontal issues and the second one, on bananas, studies issues arising across the vertical chain.

2 Cartels in the primary sector

2.1 A historical overview of cartels

Cartels originated during the mercantilist age when trading companies sharing the same interests banded together in order to control prices. Industrial manufacturing cartels have been an important phenomenon since the early period of industrialisation. Cartels boomed in the 1920s, peaked in the 1930s, and reappeared strongly after 1945 before they started fading away, especially after the 1970s (Fear, 2005). Since the mid-1990s there has again been a resurgence of interest in economic and legal studies of cartels, in particular international cartels. (Levenstein and Suslow, 2006).

International cartels were kicked off by American companies with the 1896 bilateral agreement between the Aluminium Industries AG (Swiss-German) and Alcoa (US) (Stocking and Watkins, 1946). These cartels have shaped economic and business history since the late 19th century. Historically, from the company perspective, joining, managing, or combating cartels was a major entrepreneurial act. From the government perspective, international cartels were the steering wheels to navigate through highly protected, tense and competitive global markets. Their rise was directly related to a 'complicated interplay among domestic interest group politics, manufacturers' objectives, international industrial rivalry, and geopolitical diplomacy' (Fear, 2005).

It was after 1945 that antitrust ideas spread across the world with the backing of the US economic might and cartels came to be interpreted as 'conspiracies against the public'. It is only recently that antitrust authorities across the world have recognised the graveness of the consequent market distortions in their domestic markets. The upshot is that cartels for over a century were conceived as a legitimate form of market governance and national industrial policy. Historical evidence suggests that these cartels played crucial roles in national economic development. Export cartels which involve arrangements between firms to charge a specified export price and/or to divide export markets continue to be one of the most popular types of cartels, exempted even in a cartel-hostile US after 1918 (Dick 1996; Dick in Grossman 2004).

2.2 Primary-sector cartels

Historically, the formation of raw materials and foodstuffs cartels had been mediated by colonial relations (as we will see in the case of natural rubber in the subsequent sections). Prior to 1945, these agreements were entered into by major economic powers to provide them with increased revenue and to promote their national industries; the colonies which produced these commodities were not the chief beneficiaries of these agreements (Chimni, 1987). A special treatment was given to such cartels under the draft Havana Charter treaty enacted in 1948 which exempted them from its main anti-cartel thrust such agreements to set and stabilise the prices of primary commodities. Chapter VI of the Final Act, devoted to intergovernmental commodity agreements or international commodity agreements (ICAs), specified their objectives and defined the circumstances in which they could be entered into. The primary objective of these agreements was stated to be commodity-price stabilisation. Its content was heavily influenced by the perception of the US which viewed an ICA as a necessary evil (Chimni, 1987).

While the Havana Charter was never brought into force, the principles of ICAs were adopted. Beginning with the remarkable economic impact of Organisation of Petroleum Exporting Countries (OPEC), the interest in cartels as an instrument of commodity-price stabilisation increased (LeClair, 2000). Numerous ICAs were struck in the late 1970s under the auspices of the United Nations Conference on Trade and Development's (UNCTAD) Integrated Programme for Commodities (IPC) established in 1976 (Trebilcock and Howse, 1999, p 484). These included the ones for coffee, rubber, tin, wheat, tea, etc. Unfortunately, most such agreements were dissolved due to their failure to achieve the mandated objective of commodity-price stabilisation. Only three ICAs (on coffee, cocoa and natural rubber) were reasonably successful over limited periods of time.

In October 1999, the International Agreement on Natural Rubber – at that time the last remaining ICA with a price-regulating mechanism – terminated its activities. At present, all ICAs (on cocoa, coffee, cotton, grains, olive oil and table olives, sugar, and tropical timber) are administrative in nature, serving as

fora for producer-consumer cooperation and consultations, market transparency, development projects and sources of statistics. They are not attempting to regulate markets by supply- or price-management mechanisms.

3 Case studies

3.1 The natural rubber cartel

Natural rubber is one of the leading industrial raw materials in the world today. Among the major producers are Thailand, Indonesia, Malaysia, India and Vietnam (FAOSTAT, 2008). About 48% of the global demand for natural rubber comes from China, India and Malaysia which are three major natural rubber-consuming countries within the Association of Natural Rubber Producing Countries (ANRPC).

Demand for natural rubber is part of the total elastomer demand for tyres and other rubber products. More than 60% of natural rubber is used for tyres, which is the major driving force behind changes in natural rubber demand. One of the most unique properties of natural rubber is that it is consumed as an industrial raw material but produced as an agricultural commodity, and now over 80% is being sourced from independent smallholders. Consequently, it becomes a social commodity where more than 30 million small farmers are at stake worldwide (International Rubber Study Group, 2002).

The natural rubber market is susceptible to price fluctuations just like other primary commodity markets. Crude oil prices may affect the prices of natural rubber and other input materials such as oil-based chemicals used in rubber processing. In addition, the prices of synthetic rubber, a close substitute for natural rubber, affects the pricing and demand for natural rubber. Furthermore, as natural rubber is traded mainly in US dollars, any fluctuations in the currencies of the rubber-producing countries against US dollar may cause fluctuations in prices.

Natural rubber is a unique, environmentally friendly and very useful raw material used for industrial, medicinal, transportation and personal use. Despite having synthetic rubber as a close substitute, it cannot be substituted for many of its uses by synthetic rubber. Secure access to natural rubber is a strategic issue for tyre industries and military and other use by countries that import natural rubber. However, the market for natural rubber is faced with many critical threats ranging across environmental factors causing droughts, socioeconomic factors making the production expensive, increasing competition for land by oil plantations and others (EU-PEARLS Consortium, 2010). Rubber futures have also been affected by various government policies concerning subsidies and trade restrictions. Another

threat to the natural rubber market is the possibly anticompetitive practices that aim at restricting the global supply of rubber. Unfortunately, the market for natural rubber has been always marked with cartelisation since late 19th century.

Brief history of cartelisation in natural rubber market

Phase I: Late 19th –early 20th century

What initially caused the ‘rubber boom’ first in the 19th century was the invention of bicycle. It was then further accentuated by the growth of the automobile and the expansion of the tire industry in the 20th century. Until the turn of the 20th century, Brazil and countries that share the Amazon basin, *ie* Bolivia, Venezuela and Peru, were only exporters of natural rubber (Frank and Musacchio, 2008). Brazil sold almost 90% of the total rubber commercialised in the world and this was primarily due to the rubber plantations in the Amazon basin. But the early 20th century saw a huge surge in rubber demand which Brazil found difficult to meet alone. Furthermore, the rising demand also attracted new players into the rubber market. Because Brazil was committed to a high-wage, labour-scarce production regime, it was unable to counter the entry of Asian plantations into the market.

In Asia, the British and Dutch took advantage of the superior stocks of capital and cheap colonial labour to produce rubber at low cost. Investment per tapper in Brazil was reportedly £337 circa 1910; in the low-cost Asian plantations, investment was estimated at just £210 per worker. Not only were Southeast Asian tappers cheaper, they were potentially 80% more productive (Dean, 1987).

After World War I, demand for rubber went down sharply, which caused concerns and led to attempts at reduction of world supply of rubber when in 1922 the British rubber growers started acting unilaterally by introducing export quotas to ensure profitability under what was called the Stevenson Plan. However, the Plan had many flaws and was abandoned eventually in 1928. This was around the time when Great Depression had hit the American economy, again leading to the weakening of the natural rubber markets due to a fall in demand. By 1933, natural rubber prices had fallen by 95% from \$0.75 per pound in 1925 to less than \$0.04 per pound, which formed the motivation for the first International Rubber Regulation Agreement in 1934 between France, India, the Netherlands, Siam and the UK, a cartel of natural rubber-exporting countries. The cartel managed to restrict the supply by 70% of the quotas set by the agreement and raise prices such that by 1937, natural rubber was selling for over \$0.19 per pound. Regardless of this achievement, the rubber prices never reached the desired level they were at in the 1920s and after being extended twice, the cartel was dissolved in 1944 during World War II (LeClair, 2000).

Phase II: 1980–99

Despite the dissolution of the International Rubber Regulation Agreement, the market for natural rubber was not free from cartelisation arrangements for

long. The next phase in the cartelisation of natural rubber began in 1979 under the auspices of the UNCTAD and then renegotiated in the mid-1980s (1987 Agreement) and during 1994–95 (1995 Agreement). The 1979 Agreement had as members seven exporting countries accounting for about 95% of world exports and 25 importing countries plus the European Community (UNCTAD Report).

An intergovernmental commodity body, the International Natural Rubber Organization (INRO) was setup in 1980 to administer the agreement. INRO comprised 6 producing and 17 consuming countries. The 6 producing countries were Thailand, Indonesia, Malaysia, Sri Lanka, Nigeria and Cote d'Ivoire. The 17 consuming countries were the US, UK, Japan, China, Germany, France, Austria, Belgium, Luxembourg, Finland, Ireland, Greece, Denmark, Italy, Netherland, Spain and Sweden. An international buffer stock of 550,000 tonnes was set up and the intervention was by way of buying rubber stocks when prices were too low and selling them when prices were very high (Chong-Yah, 2001). The agreement succeeded to some extent in maintaining natural rubber prices. Any attempts at raising the prices, however, faced competitive constraints from the growing substitute, synthetic rubber, which had grown in production from 7.6 million metric tonnes in 1974 to over 8.8 million metric tonnes by 1994 (Le Clair, 2000). Furthermore, struck by the South-East Asian crisis in 1997, exporting member countries proposed an increase of reference price of natural rubber in 1998, which was rejected by the importing countries.

These developments catalysed the demise of the Agreement and when Malaysia, Thailand and Sri Lanka withdrew, the Council of INRO decided to finally terminate it.

Existing natural rubber cartel: International Rubber Consortium (IRCo)

In 2001, the three biggest producers of natural rubber – namely Indonesia, Malaysia and Thailand – established the International Tripartite Rubber Organization (ITRO) which declared as its mandate, management of rubber production to ensure orderly market growth. The members agreed to reduce production (by 4%) and exports (by 10%), arguing that reduction in output would reduce global stocks which should, *ceteris paribus*, have a positive effect on rubber prices. Further, they established an organisational structure, the International Tripartite Rubber Organization (ITRO), to collectively manage their production for the next few years. To stabilise world natural rubber prices, they launched the International Rubber Company Ltd (IRCO) in October 2003, which is more popularly referred to as the International Rubber Consortium.

It is an OPEC-like cartel with the attempt to restrict production and exports of natural rubber to maintain high prices on the global market. IRCo is the only cartel in the natural rubber market that is present today and controls about 70% of the global output of rubber which is valued at exports worth about 6 million tonnes of rubber every year. In 2009, the IRCo announced plans to cut the rubber exports by a sixth. According to the following quotation, found on an

[official Thai website](#), the alleged cooperation began in the fourth quarter of 2008: 'Deputy Minister of Agriculture and Cooperatives Teerachai Saenkaew said that the three countries met at a special meeting between the ITRC and International Rubber Consortium on October 29. They discussed ways to improve the rubber situation, which was facing falling prices following the global financial crisis.'

Prices of rubber soared in the beginning of 2011 to about \$4.50 per kg but have now come down given the debt crisis and bad weather conditions in Thailand. IRCo estimated that stockpiles of their members are at low levels and has said output may be affected by heavy monsoon rains in coming months and by the global financial crisis. The Consortium has, therefore, expressed intentions to curb exports and cut trees when necessary to limit supply. Currently, rubber is sold at around \$3.40 per kg after gradually sliding by 32.35% from its initial price of \$4.50 per kg early in 2011. On 14 November, the IRCo agreed to set the rubber price at \$3.50 per kg (Yulisman, 2011).

Measures could include an Agreed Export Tonnage Scheme and Supply Management Scheme, cutting exports, and possibly domestic supply measures such as uprooting trees. This may have dire consequences on the environment and the global commodities market. And while the members of the IRCo have publicly stated that currently there is no need for price support for the natural rubber market, they are scheduled to meet in the coming months to discuss the possible interventions they would like to make in the market for natural rubber. It is important to carefully monitor the actions of the three countries given their decisions in the past and make sure that they are not allowed to take such drastic unilateral measures again in attempts to keep the rubber prices from falling in the current global scenario.

An assessment

Among the rubber-exporting countries, Thailand occupies the slot of world number one followed by Malaysia and Indonesia; other big producers being India, China and Vietnam. The ITRC formed in 2001 and later, the IRCo, with the three largest rubber-producing countries, is the only possible rubber cartel that exists today and acts to maintain high prices of natural rubber on the market through two mechanisms: the Agreed Export Tonnage Scheme and the Supply Management Scheme.

Today, there is a worldwide crunch in availability of natural rubber, and the rapidly rising prices are a major concern for all tyre manufacturers. This is attributable to the major production cuts and export quotas maintained by the big rubber growers. Hence, it was not too surprising when Bridgestone Tyres recently announced its plans to scale down the use of natural rubber in the production of tyres by almost half by 2020 (PTA News Bureau, 2011). As per the latest trends and statistics in the natural rubber market, as published by the

ANRPC, the global supply of natural rubber would slow down to 5.6% in 2011 and 3.6% in 2012 and exports are likely to fall by 3.0% in Q4 (ANRPC, 2011).

In times when the deepening eurozone crisis and influence of crude oil prices would play a huge role in dictating the trends in natural rubber prices, it needs to be ensured that the market does not attract cartel behaviour. When the price of rubber dropped to an all-time low in 2008, the members of the IRCo agreed to reduce the amount they were exporting to increase the cost of rubber. The Consortium met in 2008 and jointly agreed to reduce production by limiting plantations and tree taping, and asking businesses not to sell rubber at prices that would defeat their goals. The cartel's goal was to cut production by a sixth of the total world sales by approximately 915,000 tonnes. The Global Trade Alert, a CEPR initiative to monitor policies that affect world trade, estimated that such a jumbo measure has the potential to impact world trade worth \$26.322 billion across a total of 105 trading partners (Evenett, 2010).

The hope was to keep prices high and maintain constant income levels through this measure, just like OPEC, although it ultimately failed to implement these measures due to several other factors such as the growing demand from tyre industries in China and India and, more importantly, abundant production of natural rubber by Vietnam. No wonder the IRCo has also been previously referred to as the OPEC of rubber.

Recently, the world's largest rubber producer, Thailand, demonstrated intentions to restrict the production of natural rubber yet again. The major rubber output comes from the rubber growers and recently, rubber producers in the Southern provinces of Thailand agreed to reduce supply by 25% in attempts to stabilise its prices by adopting measures such as reducing tapping to 15 days a month instead of 20 during the high season. Wit Pratuckchai, Director General of the Office of the Rubber Repainting Aid Fund, remarked about talks that the Agriculture Ministry of Thailand was considering setting up a ten-billion-baht intervention fund to buy rubber from the market. The money would be available to finance traders who agree to buy rubber from planters at prices not lower than 120 baht/kg for unsmoked rubber sheet. A portion of these funds would also be made available to farm cooperatives to absorb supply from the market during the high season (*Business Times*, 2011).

Yet another impending matter of considerable concern is that Vietnam, another large producer of natural rubber and expected to surpass India and Malaysia in the coming years to become the third largest producer of rubber, has been requested to join the Consortium. With Vietnam on board, IRCo would control 84% of the total rubber production. Chances of this happening are pretty good given that unlike the IRCo countries, in Vietnam 60% of the rubber production is state owned and nearly half of the remaining production is controlled by one single company (Mohindru, 2010). Hence, should this proposal turn into a deal, there is a lot to cause apprehension about the monstrous control of the IRCo

on global supply of natural rubber. There is no denying that this might be a possibility that we seriously need to watch out for in the coming days. With no Vietnam to undercut the output restrictions by other three rubber growers of the Consortium this time, cheap rubber may become a thing of the past.

3.2 The banana cartel

Bananas are one of the most commonly eaten fruits worldwide. They are the world's fourth most important crop, after rice, wheat and maize; one of the biggest profit makers in supermarkets; and are critical for economic and global food security (Agritrade, 2010). However, in most banana-producing countries, production is exclusively for the domestic market, with only 21% of global production being traded internationally. Banana exports are concentrated in Central America and the Caribbean. Some of the nations in these regions are quite dependent on banana exports. On the other hand, banana trade is controlled by only a limited number of companies, with just five major multinationals (Dole, Del Monte, Chiquita, Fyffes and Noboa) controlling more than 80% of all internationally traded bananas. The cultivation and distribution of bananas therefore entails a grim reality of cartels with other anticompetitive practices. What follows is the exploratory account of cartel episodes in bananas from both historical and contemporary perspectives.

Banana cartel, 1974

By the mid-1950s, bananas were the world's fourth largest fruit crop, accounting for 40% of the total fruit crop in international trade. Exports originated mostly from Central America and northern South America. Three giants (United Fruit,¹ Standard Fruit and Del Monte) dominated land, commercial production and exports of bananas in the exporting countries. While most exports were directed primarily to the US market, with the recovery of European markets, the demand for bananas started rising rapidly in Europe as well. To maintain their dominance, the US giants expanded their sales in Europe. By 1970, two companies, United and Standard, shared 83% of the market between them. Del Monte started trading in bananas in 1969 and by 1984 its share was 19% (Tucker, 2000).

These companies succeeded in keeping the price paid to producers almost stable. A UN study in the 1970s found that no more than 17¢ of each dollar spent by North Americans on bananas went to producing countries. Following the study, in 1974 the banana belt countries of Colombia, Costa Rica, Ecuador, Guatemala, Honduras, Nicaragua and Panama joined together in an attempt to form a banana-growers' cartel to loosen the power of the American banana empires. They

1 For decades one multinational, United Fruit Company (now declined and surviving in small part as Chiquita), was often accused of bribing Latin American government officials in exchange for preferential treatment, exploiting workers, creating an abusive monopoly, and – similar to the accusations some oil companies have faced – encouraged or supported US coups against smaller nations putting in place dictatorships.

formed the Union of Banana Exporting Countries (Unión de Países Exportadores de Banano or UPEB) as a cartel inspired by OPEC.

The Philippines was the only major exporter of bananas to the US which did not join. At that time bananas were monopolised by three US companies – United Brands Company (formerly United Fruit), Standard Fruit, and the Del Monte Corporation – which handled 90% of the exports of these countries. The Union was formed with the idea of functioning as a cartel for bananas, in order to control banana supply and demand. The objectives of the organisation also included expansion of markets, ensuring remunerative and fair prices for banana exports, improving technical cooperation among member countries as well as achieving marketing improvements for better developments of banana activity.

One of the major structural changes that UPEB introduced was to propose an export tax of \$1 for every 40-pound box of bananas exported. The monopolies protested and threatened to withdraw their operations, giving place to the first ‘banana war’. However, Panama backed off, lowering its demand to 20¢ to a dollar. Ecuador, the leading producer, refused to enact the tax. Costa Rica dropped its demand to 25¢ a crate. Honduras enacted the tax of 50¢ per 40-pound box but eventually lowered it to 25¢. Nicaragua and Guatemala dropped out of the cartels. The cartel collapsed and the role of UPEB was reduced. Under a cooperation agreement with Interamerican Institute for Agriculture Cooperation (IICA), it was transformed into a centre of information and documentation for member countries, avoiding intervention policies on prices or production. It paid more attention to technical, environmental and social questions (Chapman 2009, Tucker 2000).

This cartel had far-reaching effects on the restructuring of banana trade in the long run. It changed the relationship between corporations and government with a greater government control on banana income. The most important change was the shift from long-term contract with the corporations to export tax on each carton. In 1975, during the enquiry of the suicide of Eli M Black, the chairman and president of United Brands Company, a scandal called ‘Bananagate’ was uncovered. It was revealed that the United Brands Company had paid a \$2.50 million bribe to the Honduran president to reduce the tax from 50¢ to 25¢ per box. Honduras had supplied more than 22% of United Brands Company exports in 1974. This reduction saved United Brands Company about \$7.5 million in tax payments. This revelation provoked the overthrow of the military government in Honduras, and this, in turn, led to the nationalisation of United’s railroads along with a major divestiture of land by the companies (Graham, 1990). In addition it was discovered that United Brands Company had paid another \$750,000 in bribes to an Italian official to prevent restrictions on United’s banana exports to Italy, beginning in 1970.

Banana value chain and cartel episode, 2008

World trade in bananas is still dominated by three American companies: Dole (formerly the Standard Fruit Company), Chiquita (United Fruit Company) and Del Monte. The EU offered several incentives and advantages to improve the market position of European companies such as Geest and Fyffes that traditionally bought bananas from Caribbean countries, but this has not prevented the US giants dominating the trade even in the EU countries. These companies have been under constant scrutiny. There have been two cartel episodes in banana processing and distribution channels between 2008 and 2011 in Britain.

In 2005, the European Commission (EC) started a cartel investigation in banana trading. Chiquita was the first to inform the Commission of the existence of a cartel which triggered the Commission's investigation in April 2005. Chiquita was eventually granted immunity from any fines that would otherwise have been imposed in this case. The case related to the supply of bananas to northern Europe covering Austria, Belgium, Denmark, Finland, Germany, Luxembourg, the Netherlands and Sweden. The Commission estimated that the annual retail value of the bananas sold to consumers in the eight member states affected by the cartel amounted to around €2.5 billion in 2002.

The EC carried out surprise inspections at the premises of several banana importers and found that certain banana suppliers coordinated weekly reference prices for bananas. The banana business is organised in weekly cycles. During the relevant period the importers of leading brands of bananas into the eight EU member states each set and then announced every Thursday morning their reference price (announced price) for the following week. On many occasions over the three years covered by the decision there were bilateral phone calls among the companies, usually the day before they set their price. Through these pre-pricing communications the parties disclosed their pricing intentions to competitors and coordinated their price-setting behaviour instead of deciding upon their prices independently.

In October 2008, the Commission fined Dole and Weichert €60 million for operating from 2000–02 a price-fixing cartel in eight northern EU member states. Chiquita also participated in the cartel but then too was the first to inform the Commission (see European Commission, 2008).² Del Monte is held jointly and severally liable for the fine imposed on Weichert as it controlled Weichert at the time of the infringement.

Cartel episode, 2011

In the second cartel decision in 2011, the EC concluded that the Chiquita and Pacific Fruit groups operated a price-fixing cartel in southern Europe from July 2004–April 2005. This time it affected consumers in Italy, Greece and Portugal.

² Read more in *Jamaica Observer* (2011).

The cartel was operated by Pacific Fruit and Chiquita, two of the main importers and sellers of bananas in the EU. During the period July 2004–April 2005 they fixed weekly sales prices and exchanged price information in relation to their respective brands. By doing so, they directly harmed consumers in the countries concerned. At the time of the infringement, annual banana sales in Italy, Greece and Portugal together amounted to an estimated €525 million. The Commission's investigation started with unannounced inspections in November 2007 (see European Commission, 2007). The cartel involved much bigger size of the markets concerned, and longer duration as compared with the previous case. For this infringement of EU law, the Commission imposed a fine of €8,919,000 on Pacific Fruit. Chiquita received immunity from fines for providing the Commission with information about the cartel.

An assessment

The banana industry is a vital source of income, employment and export earnings for major banana-exporting countries, mainly the developing countries in Latin America and the Caribbean. According to Food and Agriculture Organisation (FAO) statistics, world banana exports are valued at a total of \$5.8 billion in 2006, making them clearly a vital source of earnings to many countries. There is thus a strong relationship between banana-generated income and household food security. Export volume or price changes bring about income changes for vast population involved in production, both as smallholder farmers and as wage earners on banana plantations.

In addition, secondary and tertiary industries and their employees also feel the impacts of those changes. While this is a lucrative industry for retailers and distributors, banana producers are constantly pressured to produce at lower prices and push wages down in order to drop prices. In the last decade the economic power of the supermarkets in the banana supply chain has increased dramatically, with supermarkets reportedly now being the only players in the banana supply chain. The dominance of distribution by a few companies and retail by supermarkets has reduced the negotiating power of producers and traders and their opportunities to seek alternative markets with higher prices.

According to press reports, the pricing policies of supermarket chains for bananas are primarily designed to bring consumers through their doors so that they can sell them a variety of other products. This phenomenon has an important impact on the retail price of bananas in the UK. Price wars particularly between the two largest UK retailers (Asda/Wal-Mart and Tesco) have driven down prices paid to their suppliers in a number of product ranges. Between 2002 and the end of 2007, UK retail prices of bananas fell by 41%. This might have had direct impact on the prices paid to banana producers by distributing companies. While the current legal minimum price paid to a producer for a box of bananas in Ecuador is \$2.90, the same box in a British supermarket is sold for about \$25.00, with the supermarket taking 40% of the final price. Banana agribusinesses expatriate

most of the profits from producer countries. Only 12% of revenues remain in the producer countries. Plantation workers only take home 7-10%, while small farmers get only 1-2%. Low wages, job insecurity, excessively long working hours and denial of trade-union rights and freedom of association are hallmarks of these corporations' practices in Latin America. BananaLink, a public advocacy group focusing on sustainable banana trade, estimates that the British supermarket retailer Tesco makes about £1 million profit per week from banana sales, enough to employ 30,000 full-time banana plantation workers at a living wage (which would be about twice what they are paid currently).

A study called 'Collateral Damage' by Banana Link (2006) finds that the biggest supplier of bananas to UK importers in recent years has been Costa Rica. Faced with pressures to keep costs down, producers have cut wages to their own workers by a third, replaced many permanent jobs with temporary contract work and suppressed trade-union rights. Costa Rican workers are worse off today than ten years ago and investment in the country's infrastructure, formerly financed by banana revenues, has plummeted. UK supermarket price wars have damaged livelihoods at home and abroad.

4 Concluding observations

In the preceding sections, we see how cartelisation in primary commodity markets across both horizontal and vertical chains causes loss of economic welfare. The Southeast Asian natural rubber cartel discussed above is an example of types of export cartels that have the potency to severely affect the global commodity markets of natural rubber. While data on the impact of the natural rubber cartel is not enough to draw any definitive conclusions regarding the detrimental impacts arising directly out of its operations, decisions in the past and actions as well as proposed measures that have come to light make a strong case for careful monitoring of the activities of this cartel arrangement so that the world does not suffer from a global natural rubber crunch. As mentioned earlier, natural rubber is a strategic raw material and is an important tool for economic growth which cannot be replaced for some of its key usages by its closest substitute, synthetic rubber. Thus, horizontal cartelisation in its market threatens consumers of natural rubber worldwide and is a cause for concern for competition agencies of importing countries.

The case study of the European banana cartel presents a contrasting scenario. This case study shows that while the end consumers may benefit from low prices, small farmers in the producing countries bear the cost. Banana agribusinesses expatriate most of the profits from Latin American producer countries. In this case, there is a concentration of economic power by industries along value chains which has been seen to affect the profitability and livelihoods of small primary producers in the developing countries.

What is the way forward? Should the government intervene directly to manipulate market structure by forming state-sponsored cartels (eg intergovernmental cartels as discussed in this chapter)? Perhaps not. On the one hand, such cartels are not sustainable over time. On the other, in a vertically related structure, competition issues can arise at any horizontal stage as McCorriston argues in this volume. He presents a model which shows that even small departures from the competitive benchmark can have a marked impact on the distributional effects of trade reforms carried out by most countries in this era of globalisation. Clearly, the presence of downstream market power is a complex issue. In the case of the banana cartel for instance the end consumer is benefited. As a result, cartelisation is not a matter of concern to competition agencies in importing countries. Rather, this calls for actions by competition authorities in the country that produces the commodities concerned (see eg Hoekman and Martin in this volume). There may also be a case for a multilateral governance process that recognises market power imbalances in the agri-food chain (farmers, agribusiness, supermarket distribution, etc) so that countries can coordinate with one another in the regulation of international agricultural markets.

Becker (2007) argues that although a multilateral competition policy would be best suited to challenge export cartels, the current state of the political debate makes it more likely that second-best solutions such as capacity-building in lesser-developed target states will have to be established. Given the lack of capacity of competition authorities in developing and least developed countries, there is a crying need for capacity-building reforms and technical assistance that equip these countries to face such cross-border anticompetitive impacts.

What is needed through such reforms is for domestic governments to correct market distortions by building the capacity of small commodity producers in order to reduce the impact of asymmetries in power relations between the small producers and large intermediaries/suppliers across the value chain. In addition to this, the governments need to strengthen the domestic competition laws to curb anticompetitive behaviour. It is hoped that such measures would act as a deterrent against the anticompetitive practices prevailing in the commodities market structure responsible for the high prices. It would ensure entry of these producers as new market players in the world supply chain on equitable terms and threaten the survival of monopoly commodity cartels. This may be a good attempt to bring about some balance in the supply and demand dynamics of the world primary-commodity market.

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6 Export Cartels in Primary Products: The Potash Case in Perspective

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1 Introduction

Antitrust authorities have focused their enforcement efforts in recent years on international cartels and a number of such cartels have been heavily sanctioned by US authorities, by European authorities or by both (for example lysine, citric acid, vitamins, sorbate, sodium glucomate). Yet some cartels with an international dimension, *ie* export cartels, have been treated more leniently than others.

Before explaining the reasons advanced for more lenient treatment of export cartels, the cost of such cartels, in particular for developing countries, and possible solutions to the problem of export cartels, it is important to begin by defining various types of cartels having an international dimension.

The economic literature refers to a ‘pure private export cartel’ when describing a cartel composed of a group of producers within a single country whose collaborative conduct is directed solely at foreign markets and when this practice is not supported by the national government of the exporting country.

The term ‘mixed private export cartel’ refers to situations where a national (single-country) export cartel has some effect at the domestic level, such as facilitating cooperation between exporters with respect to their domestic sales. A government-directed or sponsored export cartel is a cartel among a group of firms within a single country which is either mandated, sponsored or supported by the government. An international export cartel is a cartel of exporters from more than a single country, concerning only exports. An international cartel is a cartel by producers seeking to cartelise both the export and the domestic markets of the cartel members.

There is a large consensus on the idea that international cartels, domestic cartels and mixed export cartels (to the extent that they have a domestic impact) should

be treated as *per se* violations of competition laws because they restrict consumer welfare without promoting efficiency.

2 Should export cartels be treated leniently under competition law?

A number of economic arguments have been made in favour of a lenient treatment under competition law for collaborative efforts by exporters from a single country.

2.1 Do export cartels have efficiency benefits?

It is sometimes alleged that cooperation can allow small- and medium-size firms to access international markets which they could not do individually. By pooling their resources and establishing joint-selling agencies, small- and medium-size firms can engage in joint market research, joint advertising and joint participation in fair trade. They can also reduce the costs required to meet the labelling, packaging and quality standard of countries to which they export. Finally, the pooling of resources reduces the risks of disruption in supply.

These arguments are mentioned by the US Office of Export Trading Company Affairs (OETCA), the department that administers the ETCA. They are also fairly similar to the argument presented in their defence by the members of the US Soda Ash exporter association (ANSAC) to the Competition Tribunal of South Africa. Indeed the Tribunal (Competition Tribunal South Africa, 2007) noted:

The appellants seek to place evidence before the Tribunal to show that Ansac is a legitimate joint venture whose purpose it is to pool costs and resources so as to make it possible for them to trade competitively within exports markets where there are barriers to entry and significant risks. They seek to demonstrate that by virtue of pooling costs and resources Ansac has been able to appoint independent sales and distribution staff dedicated solely to sales and services of customers, has been able to negotiate and obtain decreased freight and stevedoring charges and has entered into a variety of cost-reducing overseas warehousing and distribution agreements. The result of this is that Ansac has achieved reductions in marketing and distribution costs and can undertake competitive sales to new countries and overseas markets including those with high logistical and political risks and offer customers worldwide the enhanced reliability and efficiency made possible by increased volumes and the back-up supply commitments of US soda ash producers.

Echoing the thesis of the efficiency increasing effect of single-country export cartels, Dani Sokol (2009) states:

An alternative explanation as to the impact of export cartels is that export cartels are not a serious antitrust problem. That is, export cartels may not fall within the realm of hard core cartels. ... Export cartels may have efficiency justifications in which the coordinated conduct is merely ancillary conduct to attain the aims of a coordinated venture. A joint venture among exporters may allow for economies of scale for small and medium sized exporters and may reduce the costs of doing business internationally. This may include administrative costs, advertising, and foreign sales agencies. Another effect to export cartels is that membership in such cartels may reduce the risk that any one company undertakes in its foreign venture.

One difficulty with this kind of argument is that two different issues are treated simultaneously. On the one hand, some collaboration between firms, such as the establishment of a commercial or logistical joint venture, may have efficiency benefits. On the other hand, some other types of cooperation between exporting firms, such as the joint setting of export prices or the sharing of foreign markets may not have any efficiency benefits and may be detrimental to competition in the importing countries.

For example, the US OETCA suggests that, besides the efficiency-enhancing benefits previously mentioned, collaborative efforts by exporters could also allow them to engage in joint bidding, market sharing, and coordinated pricing to avoid rivalry among US firms. Such activities would be prohibited *per se* if they were to take place on the domestic market. Yet they seem to be tolerated or even encouraged when it comes to export markets. From the antitrust point of view, the question should not be whether all cooperation between exporters be prohibited, but whether domestic producers and exporters should be treated equally when it comes to hardcore practices.

The empirical literature is largely inconclusive on the efficiency benefits of export cartels. For example, Andrew Dick (1992) has studied whether Webb-Pomerene associations (joint arrangements by US exporters which are notified to US authorities under the Webb-Pomerene Act) have contributed to increased efficiency.

When examining Webb-Pomerene associations in sixteen commodities Dick first finds that 'export cooperation led to lower prices and larger export volumes for 6 of the 16 commodities'¹ On average, these products' export prices were 9.8% lower during cartel episodes, and their export quantities were 106.4% larger.

¹ Abrasives, animal feed, canned milk, carbon black, cotton linters, crude sulphur, dried fruit, metal laths, milled rice, paperboard, pebble phosphate, potash, soybeans, soybean oil, wheat flour and wooden doors.

Evidence on the cartels' stability suggests that five are best explained as successful efforts to reduce firms' costs of selling overseas. The sixth cartel appears to have attempted unsuccessfully to cartelise foreign markets for monopoly gain.

Second, Dick finds that for three other commodities (carbon black, sulphur and phosphate), export cooperation led to higher prices and smaller export volumes. On average, their export prices were 7.6% higher and export quantities 11.7% smaller during cartel episodes. Thus there is a strong presumption that these cartels were successful monopoly cartels.

Finally, according to Dick, the remaining seven commodities displayed no net price or quantity impact from cartel activity: 'The short lifespan of six of these cartels suggest that they were unable either to lower members' costs or to exploit any industry market power'.

Dick considers that his evidence is inconsistent with the idea that most Webb-Pomerene associations include large firms² and inconsistent with the idea that the predominant motive of export cartels is to monopolise foreign markets. It is difficult to assess the validity of Dick's claim because he does not have access to profit data. Furthermore he examines the performance of Webb-Pomerene associations rather than export cartels (even though he tends to equate one with the other). As we mentioned earlier, not all Webb-Pomerene associations fall in the category of export cartels.

In subsequent work Dick (1996) found that Webb-Pomerene associations involving a common selling agency in homogeneous industries with a high capital intensity, few large sellers and where the associates of the common selling agency represented a large share of US exports were more likely to restrict exports and raise prices.

2.2 Do export cartels lack market power?

Some authors have argued that even if collaboration between exporters from a single nation does not always lead to increased efficiency, single-country export cartels are unlikely to lead to a decrease in competition on export markets. The reason invoked is that because export cartels are defined as a cartel arrangement between exporters of the same country (as opposed to international cartels which would involve exporters from different countries), they are likely to have a lower market share of the export markets and therefore a lesser impact on world markets than international cartels. For example, Atwood (1987) says:

[I]f a cartel takes on an international as opposed to purely national character, the justification for antitrust abstention becomes less clear ... a cartel with multinational membership is likely to impose greater damage on

² For an example see footnote 21

the importing state, strengthening that state's interest in taking whatever countermeasures it can. ... Thus, an international export cartel should not expect the same deference from US or other antitrust authorities.

This argument is dubious on several grounds.

First, as some authors have pointed out, the fact that an export cartel has a low share of the world market does not necessarily mean that it does not have a high share of particular markets. Country markets may be the result of the colonial legacy of trade flows between certain developed and developing world countries (as is clearly the case for the market share of French firms in a number of West African countries). Thus, because international markets are not necessarily geographically unified, even if a single-country export cartel has a small share of the world export of a particular product, it does not mean that it cannot substantially reduce competition on some foreign markets.

Second, there is little evidence to back up the claim that export cartels have (always or even most of the time or frequently) a small market share of the export markets. From this standpoint, it is interesting to note that with respect to the sulphur, phosphate and carbon black export cartels mentioned by Andrew Dick in the study referred to above the United States accounted for a large fraction of the total world supply for carbon black (a minimum of 80% of world production in 1963), crude sulphur (50%) and phosphate (45%) and that the share of total US exports accounted for by the Webb-Pomerene associates was between 71 and 91%.

We will study below a case where it is clear that the single-country export cartel wields a lot of power on the world market.

2.3 Do export cartels maximise profits?

A third argument used to explain why export markets are treated more leniently than either domestic or international cartels is that some export cartels may not be motivated by the desire to maximise profits (unlike private domestic or international cartels). For example, Spencer Weber Waller (1989) states:

Purely private cartels are primarily motivated by a desire to maximise profits. To accomplish this goal, private cartels coordinate prices and output, deter cheating by cartel and attempt to avoid detection from antitrust enforcement. When a foreign government is involved in the creation or implementation of a single-country export cartel, however, profit maximisation may be only one of many goals being pursued by the cartel. Such a cartel may simply be a twentieth century extension of mercantilist trade policies designed to exploit foreign markets for the benefit of national producers. On the other hand, a single-country export cartel

may be used by the home government to effectuate domestic economic policies, promote employment in export sectors, obtain hard currency from abroad, or implement international agreements and understandings ranging from the prevention of dumping and countervailing duties to the resolution of international trade disputes through voluntary export restraints implemented through an export cartel.

This statement seems to suggest (although, Spencer does not make the suggestion himself) that a distinction should be made between private export cartels and government-sponsored export cartels, with the latter entailing less consumer surplus loss and justifying a more lenient attitude.

However, even if government-sponsored export cartels may have different motivations than purely private export cartels, it is hard to see why a government-sponsored export cartel (say to protect employment in the country of the exporters) should be treated differently from a private cartel to maximise profits. Even if a government-sponsored cartel does not lead to the same equilibrium as the monopolistic equilibrium, the process of competition in the country of export and in the country of import are likely to be impaired. Competition authorities are themselves quick to denounce domestic crisis cartels (which often try to protect employment) as a major source of inefficiency and to treat them as illegal agreements. Why should this not be the case when it comes to export cartels?

Altogether, it is difficult to articulate a valid economic argument, consistent with the *per se* stand of competition authorities with respect to domestic and international cartels, in favour of lenient treatment of private or government export cartels.

2.4 Are export cartels disappearing?

The lack of interest by competition authorities with respect to export cartels organised by firms in their own countries is also sometimes justified by the fact that there are fewer and fewer export cartels and that therefore they are not worth the bother. There is, however, no empirical evidence that this is the case. What seems to be the case is that there are fewer and fewer Webb-Pomerene associations registered in the United States. But, besides the fact that this does not tell us much about what is happening elsewhere the world, the reduction in the number of Webb-Pomerene associations in the US may be, as we shall see below, a misleading indicator of the of the number of export cartels originating in this country.

3 Legal treatment of export cartels under competition law

Yet, from a legal point of view export cartels are treated differently from domestic or international cartels in most jurisdictions. In a small number of countries export cartels may benefit from a formal exemption from competition law; in other countries they may benefit from an implicit exemption. However the difference between the two situations may not be significant.

3.1 Explicit exemption

In the US, the Webb-Pomerene Act of 1918 allowed US exporters to act collectively to exercise their collective bargaining power in foreign markets. The rationale was the necessity for US exporters to counter the economic power of dominant foreign buying cartels but the wording of the Webb-Pomerene Act does not limit its application to small exporters facing powerful buyers or buyer cartels. However, the scope of the exemption from US antitrust law granted by the Webb-Pomerene Act was not entirely clear. For example, in 1950 the Justice Department challenged joint exports by a dominant group of US companies in the coated abrasives industry (see Atwood, 1987; and *US v Minn Mining*, 1950). The companies claimed that their arrangements made exports from the United States more profitable. The court rejected the argument of the firms and held that any restriction on US exports was a violation of the Sherman Act. The Export Trading Company Act of 1982 sought to clarify matters and establishes that provided that they do not lead to a restriction on imports into the United States and that they do not restrict competition among the exporters on the US domestic market (*ie* as long as they are not mixed export cartels), they are not a US antitrust concern.

The clear rule established by the Export Trading Company Act of 1982 makes it unnecessary for US firms participating into an export cartel to seek the protection provided by the Webb-Pomerene Act if their practices of price-fixing or market allocation do not have a domestic effect in the United States. The situation was quite different before 1982 when the interpretation of the exemption was less clear. Thus one could expect that even if the number of pure export cartels remained constant or increased over time, the number of registered Webb-Pomerene associations would have decreased (which it did).

The US is not the only country to have an explicit exemption for export cartels. Levenstein and Suslow (2005) identify seventeen countries having an explicit exemption for export cartels. Australia is one of them and, like the United States, it wants to control (through a registration system) that such export cartels do not translate into restriction of competition on the domestic market. As quoted by Levenstein and Suslow (2005), the Australian Competition and Consumer Commission is 'open to arguments that an export consortium has been structured in a way such that domestic competition will not be substantially lessened, so

that coordination of supply to overseas markets and information exchanged in an export consortium is quarantined from activities undertaken on the domestic market’.

Similar provisions can be found in the competition laws of developing countries. For example, section 5(ii) of India’s 2002 Competition Act states: ‘Nothing in this section [on anti-competitive agreements] shall restrict ... the right of any person to export goods from India to the extent to which the agreement relates exclusively to the production, supply, distribution or control of goods or provision of services for such export’.

The Webb-Pomerene Act and other similar pieces of legislation have been harshly criticised by developing countries during the multilateral debate on the interface between trade and competition as revealing the duplicity of developed countries which allowed their firms to engage on foreign markets (and in particular in developing countries) in practices which were illegal domestically. This accusation is, however, partly unjustified. First, as we just saw, competition laws in developing countries also have this type of provision, so they are not restricted to developed countries.³ Second, a distinction should be made between two questions: first, whether a number of jurisdictions which have a domestic competition law turn a blind eye when their firms engage in practices on export markets which they prohibit domestically and, second, whether the Webb-Pomerene Act or similar legislation exempting export cartels from domestic competition law are the means through which domestic firms are allowed to engage in such illegal practices abroad. The Webb-Pomerene Act and the Australian law do not encourage or authorise US or Australian firms to engage in practices abroad which are illegal domestically, nor do they condone such behaviour. What the Webb-Pomerene Act does is merely ensure that to the extent that US firms engage in export cartels, those export cartels do not restrict competition on the domestic market.

Aside from countries that have an explicit exemption against export cartels, the competition laws of a number of countries include the possibility of an exemption for domestic anticompetitive practices which have the effect of promoting exports. For example, Section 3(b)(i) of the 1998 South African Competition Act lists ‘maintenance or Promotion of exports’ as one of the possible grounds for granting an exemption for a restrictive agreement or practice. Similarly, in China, agreements that ‘safeguard the legitimate interest in foreign trade and economic cooperation may be exempted’. The availability of the exemption does not require proof that such arrangements will not substantially restrict competition or that Chinese consumers will be able to share in the benefits of the agreements.

Depending on how competition authorities or courts interpret ‘the promotion of exports’ or the ‘legitimate interest of foreign trade’, it is conceivable that these countries could exempt mixed export cartels (*ie* export cartels from a single

3 A different question, which we will discuss later, is that of knowing whether permitting export cartels should be allowed in developing countries but forbidden in developed countries.

country which have a domestic anticompetitive effect) or even international export cartels (*ie* export cartels by exporters from different countries).

3.2 Implicit exemptions

Almost all countries which do not have an explicit exemption from domestic competition law for export cartels have an implicit exemption for such cartels. For example, in their examination of 51 countries which allow export cartels, Levenstein and Suslow (2005) note that 34 countries lacking an explicit exemption maintained an implicit exemption because their domestic antitrust legislation limits the law's reach to the domestic market. Recent developments in competition law at the international level are increasing the number of countries with such an implicit exemption. They state: '[T]he growing consensus among competition authorities around the fact that competition law enforcement should be effects-based rather than form-based and the lack of investigatory powers of competition authority to investigate outside of their domestic territory inevitably pushes them not to intervene when the effects of a possibly anticompetitive practices, such as an export cartel, are not felt in their jurisdiction'.

Overall, competition authorities in most countries (there are approximately 120 countries which have a competition law) do not intervene to prevent their domestic firms from engaging in price-fixing and market-sharing by export cartels, even though they consider that the same practices, if they have a domestic effect, would be prohibited by their competition law. Thus they are not likely to intervene on export cartels initiated by firms established in their countries as long as these export cartels only have an effect on foreign countries.

4 The cost for export cartels on developing countries: The case of potash

A telling example of the cost that export cartels in primary products can impose on developing countries came to the fore during the summer of 2010 when BHP Billiton made a \$39 billion hostile takeover bid for PotashCorp of Saskatchewan Ltd in Canada. This merger proposal (one of the biggest mergers in 2010), already controversial because it was a hostile takeover, became even more controversial when Graham Kerr, BHP Billiton's Canada head, announced at the time that his firm made the offer, 'We believe in running our assets 100% of the time and selling our products at market price' (*Wall Street Journal*, 2010). To understand the meaning of this apparently innocuous statement, one has to provide some background information on the potash market.⁴

⁴ This account of the history of the potash industry and of the economic consequences of the proposed merger draws on the Conference Board Report (2010).

Potash is mined from naturally occurring ore deposits and used primarily as an ingredient of agricultural fertilizer. It is (for the most part) a homogeneous product, but only a handful of countries possess significant quantities of this resource. Unlike other mining products, potash is relatively costly to store because it cannot be left out in the open air. Thus inventories typically constitute only around 1% of supply and potash is very much a just-in-time good with a short cycle between production and use. According to a complaint filed by US consumers of potash the majority of production costs for potash are variable rather than fixed; therefore, producers face less pressure in a given year to hit any particular output target in order to recoup their expenses (US Court of Appeals, 2011). Finally, there are high barriers to entry in the potash business. In addition to first finding a promising source of potash deposits, any potential entrant would incur approximately \$2.5 billion in start-up costs over a five- to seven-year development period before production could commence.

Canada owns 52% of the world's known reserves of potash (mostly located in Saskatchewan) while Russia owns 21%, Belarus own 9% and Germany 8.4%. Thus the geographical supply of potash is highly concentrated.

In the 1950s and 1960s, at least 11 separate potash companies operated in Saskatchewan, which limited scale economies in production as well as the ability of producers to maximise profits from the resource, as they would compete with one another to bid down prices. The industry was therefore often faced with periods of oversupply and falling prices until marginal producers dropped out of business to restore balance. In the late 1960s, the Government of Saskatchewan introduced a variety of measures to limit production, including production quotas, marketing controls, and a floor price. Canpotex began operating in 1972 as the private export marketing arm for the potash industry.

In 1987, the Government of Saskatchewan passed legislation giving its cabinet control over the supply of potash and the creation of new mines. In parallel to these supply- and pricing-management strategies, the industry continued to consolidate into fewer producers.

This consolidation was given impetus through the 1975 creation of the Potash Corporation of Saskatchewan (PCS), a Crown corporation. PCS proceeded to acquire several existing mines and develop greenfield projects on its own. By 1980, PCS was by far the industry's largest player, having acquired its Cory, Rocanville, Alwingsal and Allan mines among others.

In the early 1990s, the Government of Saskatchewan decided to privatise PCS. Many governments around the world had difficulties managing commercial enterprises. The view was that private management would improve the efficiency of the companies while increasing the pool of capital upon which firms could draw for capital expenditures (which is especially critical in mining). The Government of Saskatchewan wanted to realise the benefits of private management while still

maintaining an oligopolistic marketing structure (via Canpotex and through industry consolidation). It proceeded to organise its royalty and tax regime in a way to maximise its share of rents from the industry, given its market structure.

The Province took until 1993 to fully divest itself of its shares in PCS. Today, PCS is the world's largest potash company, with about a quarter of total global capacity (including its offshore investments), representing 21 million metric tonnes of primary product capacity. PCS is also present on other markets. It ranks first in potash, third in phosphates, and third in nitrogen.

The second and third largest producers of potash in Canada are Mosaic and Agrium (both members of the export cartel Canpotex) with a total share of 35% of the world market. Less than 5% of Canadian potash production is sold domestically.

In Russia, Silvinit is the largest miner of potash, and IPC is the exclusive international distributor of Silvinit's potash product. BPC, jointly owned by Uralkali (a Russian company headquartered in Moscow) and Belaruskali (owned by the Republic of Belarus) is the exclusive international distributor for its mother companies. Together they have a total market share of 35% of the world market.⁵

The demand for potash is directly driven by the demand for crops, which can be cyclical and can depend on whether the crops are consumed directly or are used as feed for livestock. When food prices rise, there is incentive to increase crop yields by adding potash to the soil. The largest national markets for potash are the United States, China, Brazil, India, Indonesia and Malaysia. A large number of developing countries depend entirely or partially on imports to cover their domestic demand. For example, India, Indonesia and Malaysia, which are among the largest consumers of potash, import all their consumption as they do not have any domestic source of potash. Brazil imports nearly 90% of its needs. China imports about 60% of its needs. Altogether nearly 80% of potash extracted is exported.

Several factors are likely to increase the demand for potash in the coming years. First, higher incomes in developing economies will mean changes in their consumption habits with more calories per day from staple grains, and increased demand for protein-rich diets, significantly increasing meat consumption. Second, the world's population will increase from nearly seven billion today to more than nine billion by 2050. Third, the inventory of arable land available for agriculture purposes is gradually shrinking which means that the remaining farmland needs to be more productive and deliver higher-quality yields. This is especially true in developing countries where yields are often much lower than they are in developed countries. Since potash accounts for a relatively small percentage of total crop-production costs and has no obvious substitutes, demand for the product is relatively inelastic in the long run. Demand is more

⁵ Silvinit and Uralkali merged in 2011.

elastic in the short run because farmers can opt to reduce the amount of fertilizer they use in a given season.

Potash prices were low and stayed within a range of between \$125 and \$200 per K₂O tonne (price at the Saskatchewan mine gate) for a period of nearly 20 years, starting in the mid-1980s. Prices declined in the early 1980s until US authorities pursued antidumping remedies in 1987. The Province then took measures to cut back volumes and stabilise prices.

Since the mid-2000s gradual improvements in demand, accompanied by almost no supply increases, have resulted in a tightening of the supply/demand balance for potash and an improvement in potash prices during mid-part of the past decade, which culminated in a potash price spike in late 2008 and early 2009. The end result is that the mine gate price in Saskatchewan averaged \$825 per K₂O tonne in 2009. Prices then fell in response to a sharp decrease in orders in 2009. PCS (in concert with Mosaic Co and Agrium Inc) significantly reduced volumes to stabilise prices. In 2009, PCS took its utilisation level well below 50 per cent in order to shore up prices.

The following Table 1 summarises the results of PotashCorp for potash over the period 2003 to 2011. Those results reflect the market dynamics previously mentioned. As can be seen the selling price of potash for PotashCorp was multiplied by five between 2003 and 2011 with a first increase in 2004 and a very important increase in 2008 when prices were multiplied by 2.7 compared to the previous year. In 2009 farmers who could not pay the high price for potash delayed or cancelled their orders with a significant decrease in the quantity demanded for PotashCorp and a significant decrease in production for this firm (its production decreases from 8697 in 2008 to 3405 thousand tonnes in 2009). Over the period the gross margin of PotashCorp potash operations is multiplied by 13 whereas the increase in sales is modest (about 30%).

Table 1 PotashCorp results, 2003–11

	2011	2010	2009	2008	2007	2006	2005	2004	2003
Production (tonnes)	9343	8078	3405	8697	9159	7018	8816	7914	7094
Sales ('000 tonnes)	9046	8644	2988	8547	9400	7196	8164	8276	7083
Gross margin (US\$ mil.)	2722.0	1816.0	730.40	3055.5	912.3	561.1	707.4	422.8	203.7
Average realised price	412	316	403.56	448.60	166.65	145.42	142.57	102.97	80.02

Source: PotashCorp annual reports.

Canpotex, the export marketing and distribution company for Canadian potash producers, is a coordinating mechanism for marketing and the offshore sales of the potash supply of each of its three stakeholders for export outside of North

America, and it manages the logistics for shipping potash to these markets. According to the Conference Board Report (2010), 'Canpotex takes ownership of the potash at the mine gate, manages its transportation by rail to West Coast ports, oversees its loading onto seaborne vessels, and arranges delivery in customer markets. It is also markets the potash produced by its shareholders in overseas countries. Canpotex sells Saskatchewan potash in about 30 countries, with the proceeds of the sales being distributed to its shareholders based on their share of the total production sold through Canpotex'. The same report makes the strategy of PCS and Canpotex clear when it states: '(PCS) uses its jointly owned subsidiary, Canpotex, to coordinate sales with Mosaic Co. and Agrium Inc. into export markets outside of North America and counts on market discipline among the three producers in determining volumes for North America ...'. The report explains:

There has been much discussion of PCS's (and also Mosaic's) role as a so-called 'swing producer' in the marketplace. The role of a swing producer is to adjust volumes to changing demand conditions so as to minimise price volatility, particularly on the downside. This role is of little consequence when global supply and demand are in rough alignment, but should play a more important role when global demand drops, as it has quite significantly during recent recessions. PCS was faced with oversupply conditions in the early 1980s, the early 1990s (due to the collapse of Soviet Union), and most recently in 2008–09 due to the global recession. In this latter case, PCS (in concert with Mosaic Co. and Agrium Inc.) significantly reduced volumes to stabilise prices. In 2009, PCS took its utilisation level well below 50 per cent in order to shore up prices.

Canpotex is specifically structured to exclude the US and Canadian markets. Export marketing through Canpotex is explicitly authorised and encouraged by Canadian law. In other words, Canpotex's coordination of Canadian potash exports is lawful under the domestic law of that country.

The Conference Board Report also gave indications that the Canadian producers may cooperate with Russian and the Belarus producers to restrict production in order to maintain high export cartels. It states:

It is something of an exaggeration to say that PCS is a swing producer that acts differently from companies in other major producing nations. In fact, in the current market (and the foreseeable market going forward) all the major global potash players adjust their supply in response to rising and falling demand conditions. Consider, for instance, the most recent drop in global demand in the 2008–09 period. Companies in the major producing countries – Canada, Russia, and Belarus – all cut back on volumes in the face of a declining marketplace. The only country that continued to increase production was China. Less than 10 years ago, the Russian producers started to push up against capacity and realised it was

in their interest to behave like oligopolists. By all accounts, that is what they are now doing. The tendency for concentration in the Russia/Belarus supply structure makes this behaviour just as likely going forward.

The complainants in the US Seventh Circuit Court of Appeals case referred to earlier allege that Canpotex and the Russian and Belarus producers not only behave as members of a non cooperative oligopoly but actually collude to maintain high prices for potash on export markets in developing countries through reductions of outputs when demand is depressed. These allegations include elements indicating that the Canadian and Eastern European potash producers meet regularly and that they follow behaviour which would not make sense without an anticompetitive agreement.

With respect to contacts between the two sets of producers, the complaint notes that Canpotex previously had a joint marketing agreement with Uralkali; that the interests of Uralkali and Silvinit are aligned because they share a common, influential shareholder, Dmitry Rybolovlev, who is alleged to own 66% of Uralkali and 20% of Silvinit's voting stock; and that the Canadian potash producers and their Eastern European counterpart meet at the annual conference of the International Fertilizer Industry Association where price increases were announced by major potash manufacturers in 2007. Furthermore, according to the complaint, a PCS executive is alleged to have publicly complimented BPC (the Belarusian exporter) for showing 'tremendous discipline ... in terms of managing supply in the marketplace'.

With respect to the behaviour of potash manufacturers on export markets, the judgement states:

... [T]he complaint ... allege[s] specific parallel business conduct consisting of reductions in output designed to keep prices artificially high and parallel increases in prices. Some of these allegations are general and others specific to certain foreign markets. For example, the complaint alleges that as global demand for potash declined in the second half of 2005, the defendants 'jointly restricted' the output of potash for the purpose of maintaining an artificially high price. In the last two months of 2005, PCS, the world's leading potash producer, announced the shutdown of three of its mines. These shutdowns resulted in the removal of 1.34 million ton of potash from the market. At the same time, Mosaic also announced a temporary, 200,000-ton reduction in potash production. Uralkali, Belaruskali, and Silvinit followed suit with reductions of their own in the first half of 2006. These production cuts continued through 2008 despite the fact that the defendants maintained sizeable excess capacity. The complaint also points to an event in October of 2007, when Silvinit announced that a sinkhole at one of its mines might cause a long-term disruption in production at that location. Within a day of the announcement, PCS, Uralkali, Agrium, and BPC (but apparently not Mosaic) announced that they would suspend

new sales in the wake of Silvinit's disclosure. Roughly two weeks later, Silvinit announced that the sinkhole was not as severe as initially feared and that the mine in question would return to business as usual. At this point the other companies ended their self-imposed moratorium on new sales. The complaint alleges that [t]he joint suspension of sales by PCS, Uralkali, Agrium and BPC during the shutdown by Silvinit, a supposed competitor, makes no economic sense absent a cartel. Had the market truly been competitive, defendants would have the incentive to increase, not suspend, production to take advantage of their competitor's reduced output and thus gain market share. The complaint's other factual allegations of parallel conduct focus exclusively on three foreign markets – Brazil, China, and India – giving examples of supply and pricing activity by the defendants beginning in 2003. For example, the complaint alleges that in 'early 2003, IPC announced that it would increase its potash prices by eight dollars per ton. Within a month Canpotex announced that it would seek a nearly identical price increase for its sales in Brazil.' Then, '[b]y mid-2003 all suppliers to Brazil were announcing that they had achieved an increase of eight dollars per ton.' Later, in 2004, 'IPC announced a price increase to buyers in India,' and '[s]hortly after these announcements, PCS announced two five dollar per ton increases within a five week period.' Other allegations focus on claimed coordination of supply restrictions in these countries. For example, the complaint alleges that potash demand dropped by 20.9% in Brazil during 2005 and the Russian and Belarusian defendants reduced their combined exports to that country by the same percentage; Canpotex followed suit and cut its Brazilian exports 'by almost exactly the same percentage.' Plaintiffs also allege that Canpotex and BPC jointly restricted exports to China in an effort to boost the price of potash in that country.

Although it is fair to say that these are merely allegations, it is quite clear when these allegations are combined with the Conference Board Report (an official report to the Canadian Government) that Canpotex, the Canadian export cartel, alone or in conjunction with the Eastern European producers, manipulates exports of potash to important developing countries in order to maintain the monopoly rent of producers. Commenting on the recent history of potash prices, the Conference Board states:

There have been periods of extreme price competition in the past. In particular, the mid-1980s saw a period of weak demand and very low prices. In more recent years, the concentration of market power amongst a few firms, a reduction in the amount of excess capacity in the industry, and a high level of market discipline among leading producers to manage production in response to market demand and thus maximise prices contributed to potash prices reaching a record high in late 2008 and early 2009. Most of the variations in prices since 1980 were not due to errors by producers in putting excess capacity on the market; rather they were

caused by unforeseen drops in demand. That was the case with the collapse of Soviet demand in the late 1980s and early 1990s, and once again in the aftermath of the global credit crisis.

With this background in mind, it is easy to understand both what the apparently innocuous statement of the CEO of BHP ('We believe in running our assets 100% of the time and selling our products at market price') meant and why it raised alarm in Canada. BHP Billiton was signalling that if its bid to buy PotashCorp was successful, it would not continue to sell through the Canadian potash export cartel (Canpotex) and would start competing with other potash manufacturers. As the *Financial Times* (2010) reported, if successful, the move by BHP Billiton 'would torpedo the industry's current arrangement of matching output with supply to maintain potash prices at high levels'. Whether BHP Billiton would have effectively followed such a policy had its bid been successful is open to question and this announcement may have served other strategic purposes than announcing the future policy of BHP Billiton on the potash market.⁶ But the statement prompted the Government of Saskatchewan (which is interested in the potash market, among other reasons because it collects both royalties and profit taxes from Canadian potash manufacturers) to ask the Conference Board to study the possible consequences of a takeover of PCS by a firm committed to competition on the potash market (whether BHP Billiton or the Chinese State-owned enterprise Sinochem, a buyer of potash, which was rumoured to be interested in mounting a bid for PCS with the Singaporean sovereign wealth fund Temasek Holdings). On 21 October 2010 Saskatchewan Premier Brad Wall, referring to the Conference Board report, estimated that the Province could lose three billion US dollars in royalties over 10 years from PotashCorp under BHP's control (due to the lower potash prices and therefore lower royalties) and declared his opposition to the merger.

The Conference Board Report is very instructive because it compares the world potash market equilibria between 2011 and 2020 under two possible scenarios. The base scenario considers what would occur if the market discipline that potash producers have displayed in recent years continues. It assumes that producers hold back some of their potential production to prevent prices from falling and reducing the return on their capital. The alternative scenario, called the 'full production scenario', considers what might occur if a potential acquirer of PCS would leave Canpotex and if market discipline broke down and instead of choosing to maximise profits, producers instead chose to maximise market share. The key assumption in this scenario is that if a major producer like PCS breaks ranks with the other producers and maximises production, all other market participants will follow suit given the homogeneity of potash.

The results for the two scenarios are as follows.

⁶ At the time BHP Billiton was also considering merging its Pilbara iron-ore operations in Australia with Rio Tinto and there were rumours that the statement on potash was mainly meant to signal to the Australian Government the pro-competition stand of BHP-Billiton.

Table 2

	2009	2010	2011	2012	2013	2014	2015	2020
Base scenario								
Price (\$CAN/K ₂ O/ tonne)	825.6	531.7	574.3	591.0	601.2	611.2	611.2	734.0
Production (millions of KCl tonnes)	7.0	11.8	16.6	18.2	19.9	21.4	22.2	25.6
Full production scenario								
Price (\$CAN/K ₂ O /tonne)	825.6	531.7	574.3	356.7	245.0	225.7	217.5	488.2
Production (millions of KCl tonnes)	7.0	11.8	16.6	20.5	24.4	26.8	28.0	31.8

Source: Conference Board Report on Potash

It is clear from these figures that the cartel could restrict output in order to maintain prices from 2012 on with the result that if the price of potash is more stable under the cartel scenario than under the competitive scenario, it is also much higher (nearly twice as expensive) between 2013 and 2020.

The consequences of the cartel on both China and India, two of the largest importers of potash, can be easily computed.

On average, under the cartel scenario, the price of potash would be doubled or CAD\$ 321 more expensive per tonne than under the competitive scenario between 2011 and 2020.⁷

If we assume that China will need to import an average of 5 million tonnes of potash per year between 2011 and 2020, an estimate based on its 2010 imports, the surcharge it would pay on average, each year, would be CAD\$182 per tonne (and therefore $182 \times 5,000,000 = \text{CAD}\$910,000,000$ or US\$901,000,000 per year), if it succeeds in getting an 18% discount from the cartel price (as it did in 2011). For the year 2015, for which the difference in price between the two scenarios is the largest, the surcharge for China would be $(611.2 \times 82 - 217.5) \times 5,000,000 = \text{CAD}\$1,422,520,000$ or US\$1,408 billion.

Chinese officials are very aware of the detrimental impact of the Canadian potash export cartel and of its coordination with the Russian and Belarus cartel. For example, on 25 July 2011 an article published by Chinadaily.com reported that according to the international potash fertilizer price negotiation disclosed on 30 June, the CIF (cost insurance and freight) price of potash fertilizer for import into China had risen \$70 per tonne compared to that of the first half of this year, a price increase of 17.5%. The article reported that according to Li Qiang, a spokesperson for Sinochem Group, the international price rise of potash fertilizer was partly

⁷ As the Conference Board report does not give details on the speed of the adjustment in prices under either scenario between 2015 and 2020 but does indicate the price of potash in 2015 and in 2020, we will assume that the prices would increase linearly between the two years.

caused by the international price rise of raw materials and resources. 'However, the most important and fundamental reason is the intensified monopoly of the international suppliers in this field', the newspaper quoted Li as saying. Feng Mingwei, the deputy general manager of Sinofert Holdings Limited, the largest fertilizer importer in China, was quoted in the article as saying: 'Our dependence on imported potash fertilizer is a threat to our national food security.' The article went on to say that to cope with the price rises and potash fertilizer shortages, China needed to establish a strategic fertilizer reserve system for the off-season as well as strengthen the 'negotiation mechanism of potash fertilizer import'⁸.

If we now turn to India and if we assume that it will need an average of 6.5 million tonnes of potash per year between 2011 and 2020, the overcharge it will pay each year will be on average CAD\$1.183 billion (US\$1.171 billion), if it also succeeds in getting an 18% discount, and could reach CAD\$1.825 billion toward 2015 when the pressure of demand will be greatest. Thus, if the Indian government keeps on paying an annual subsidy of US\$1.5 billion to make potash fertilizers more affordable for Indian farmers, from 80% to 100% of this subsidy will in fact finance the monopolistic rent that potash producers will enjoy on their sales to India, thanks to the restrictive practices of Canpotex.

Overall, in the case of potash, the instability of its world price is due to a variety of factors. Some of these factors influence the demand for potash, such as shifts in the demand for food products due to varying economic conditions, the ability of farmers to defer the use of fertilizers in the short term and changes in the agricultural policy of governments with respect to subsidisation of fertilizer uses. Other factors influence the supply of potash, such as the fact that whereas there is a general upward trend in the consumption of potash, increases in capacity only occur discretely and after many years of preparation and investment in new mining sites. In this context, by monitoring the quantities put on the market the Canadian export cartel contributes to the stability of the world price; but this stability comes at a huge cost for importing countries and may have dramatic consequences in developing countries struggling to feed their rapidly increasing populations.

8 Although China is very concerned about its own food security, its trade policy with respect to fertilizers can also be a threat to the food security of other countries. Indeed, potash is not the only fertilizer which is crucial for food security. Phosphorus, which is a nutrient necessary for all living matter, is even more important. While phosphorus demand is projected to increase, the expected global peak in phosphorus production is predicted to occur around 2030 and current global reserves may be depleted in 50–100 years. The world's remaining phosphate rock reserves are under the control of a handful of countries, including China, the US and Morocco. China together with Morocco has 60% of the world phosphorus reserve. Starting in 2008, China, which accounted for between 20 and 30% of world trade in phosphorus, imposed a 100–175% tariff to curtail phosphorus exports and keep its phosphorus in China thus limiting the supply for a number of other countries and reinforcing the power of the three firms which dominate the international trade of phosphorus: Mosaic (Cargill) which owns or controls over 30% of the US reserves of phosphate rock, Potash Corporation of Saskatchewan, which has 50% of the US domestic reserves, and Office Cherifien des Phosphates (OCP) the Moroccan phosphate monopoly). Cargill and PotashCorp. have formed an export cartel, PhosChem, organised under the 1918 Webb-Pomerene Act (which shows that they are trying to get access to world markets). See Taylor (2010).

As the example of the potash cartel shows, export cartels can be very detrimental to importing countries. We have already seen that exporting countries usually exempt, either explicitly or tacitly, such export cartels from the scope of application of their domestic competition law. The question to be asked is then whether, in countries which are direct or indirect victims of such export cartels, domestic competition law enforcement can be used to fight such practices.

5 Can importing countries use their domestic competition law to fight foreign export cartels? US, Indian and Chinese reactions to the potash export cartel

In most countries anticompetitive practices which have a domestic effect fall within the ambit of the domestic competition law. Thus the presence of an export cartel from firms in country A that results in price-fixing or market-sharing in country B is, in most cases, a violation of the competition law of country B. Yet efforts made, both in developed and developing countries victims of such export cartels, to fight such practices through domestic competition law enforcement have often failed for at least two reasons: either because the country is an indirect rather than a direct victim of the export-cartel practices or because the competition authority of the importing country was unable to secure the necessary cooperation from the authorities in the exporting country to gather the proof required to activate its domestic competition law. In what follows, we will give examples of both circumstances.

5.1 Can indirect victims use the antitrust law of their country to fight foreign export cartels?

To illustrate the first situation (where a country is the indirect victim of an international cartel), it is interesting to provide some background on the US case against the potash cartel mentioned earlier.

Two separate groups of plaintiffs, who were direct and indirect potash purchasers in the United States, filed nearly identical antitrust class actions. The first group composed of Minn-Chem, Inc, Gage's Fertilizer and Grain, Inc, Kraft Chemical Company, Shannon D Flinn, Westside Forestry Services and Thomasville Feed & Seed, Inc – sued on behalf of themselves and all others who purchased potash products in the United States directly from the defendants. The second group composed of Kevin Gillespie, Gordon Tillman, Feyh Farms Company, William H Coaker, Jr, and David Baier sued on behalf of themselves and all others who purchased potash products in the United States indirectly from the defendants.

The antitrust class action alleged a global conspiracy to raise the price of potash at artificially high levels in violation of Section 1 of the Sherman Act, 15 USC. § 1.

The plaintiffs argued that from 2003 to 2008, potash prices in the United States increased by a staggering amount – roughly 600% – after years of relatively stable pricing. They contended that this spike in prices could not be explained by rising production costs, increased demand or production shortages since demand was declining and Canpotex members had plenty of excess capacity. The plaintiffs argued that the price surge was the result of an agreement by the defendants in three foreign markets (Brazil, China, and India⁹), where prices served as a ‘benchmark’ for potash sales in the US

It is important to compare the allegations of the complaint to what we know from the Canadian Board Report referred to earlier. First, concerning the price increase, available data shows that the price of potash (FOB Vancouver), which was around CAD\$100 in January 2003, reached about CAD\$580 in July 2008 and, after a short decline to about CAD\$450 remained in the CAD\$500 to 600 range in 2009. Hence the nearly 600% increase in the price of potash in the United States seems to be closely correlated with the Canadian export price of potash set by Canpotex.

Second the Conference Board Report discussing the role of PCS in setting the price of potash states:

The role of a swing producer is to adjust volumes to changing demand conditions so as to minimise price volatility, particularly on the downside. This role ... should play ... [an] important role when global demand drops, as it has quite significantly during recent recessions. PCS was faced with oversupply conditions ... most recently in 2008–09 due to the global recession. In this ... case, PCS (in concert with Mosaic Co. and Agrium Inc.) significantly reduced volumes to stabilise prices. In 2009, PCS took its utilisation level well below 50 per cent in order to shore up prices.

The report continues with the following observation:

In fact, in the current market (and the foreseeable market going forward) all the major global potash players adjust their supply in response to

⁹ The Court decision (US Court of Appeals, 2011) notes: ‘For example, the complaint alleges that in “early 2003, IPC announced that it would increase its potash prices by eight dollars per ton. Within a month Canpotex announced that it would seek a nearly identical price increase for its sales in Brazil.” Then, “[b]y mid-2003 all suppliers to Brazil were announcing that they had achieved an increase of eight dollars per ton.” Later, in 2004, “IPC announced a price increase to buyers in India,” and “[s]hortly after these announcements, PCS announced two five dollar per ton increases within a five week period.’ Other allegations focus on claimed coordination of supply restrictions in these countries. For example, the complaint alleges that potash demand dropped by 20.9% in Brazil during 2005 and then Russian and Belarusian defendants reduced their combined exports to that country by the same percentage; Canpotex followed suit and cut its Brazilian exports “by almost exactly the same percentage.” Plaintiffs also allege that Canpotex and BPC jointly restricted exports to China in an effort to boost the price of potash in that country.’

rising and falling demand conditions. Consider, for instance, the most recent drop in global demand in the 2008–09 period. Companies in the major producing countries – Canada, Russia, and Belarus – all cut back on volumes in the face of a declining marketplace.

Thus, it seems highly likely that the price set by the Canadian export cartel, which is in principle directly applicable to all Canadian exports other than exports to the United States, also influences the price set individually by members of Canpotex when they export to the United States and the Canadian Board report confirms that the cartel policy was responsible for the increase of world prices to a high level in 2008–09 and the maintenance of these high prices in late 2008–early 2009, forcing farmers to cut back on their use of potash.

Finally, the pricing data from the annual PotashCorp reports (see Table 2 below) suggest that there is a close correlation between the world prices of potash and the potash prices in the United States (with the US prices being usually even higher than the cartel prices for the rest of the world).

Table 3

	2011	2010	2009	2008	2007	2006	2005	2004	2003
Average realised price (\$US)	412	316	403.56	448.60	166.65	145.42	142.57	102.97	80.02
Price potash N. America	482	364	463.74	441.38	189.26	168.95	157.63	107.07	80.33
Price potash offshore	375	285	368.84	452.43	153.41	130.56	133.13	100.33	79.80

Source: PotashCorp Annual Reports

Altogether there is quite a bit of evidence that the price of potash in the United States is directly affected by the international cartel price even if formally the Canadian export cartel discipline does not apply to exports to the United States.

The defendants in the US case claimed that the district court lacked subject matter jurisdiction under the Foreign Trade Antitrust Improvements Act (FTAIA), 15 USC. § 6a, which limits the extraterritorial reach of the Sherman Antitrust Act to foreign anticompetitive conduct that either involves US import commerce or has a ‘direct, substantial, and reasonably foreseeable effect’ on US import or domestic commerce. In a separate argument the defendants also argued that the plaintiffs had not demonstrated the existence of an illegal explicit or tacit agreement, that they had only established oligopolistic interdependence and that the fact that ‘firms in a concentrated market [that] recognis[e] their shared economic interests and their interdependence with respect to price and output decisions,’ was ‘not in itself unlawful’ (*Bell Atlantic Corp v Twombly*, 2007; alterations in Twombly).

The court focused on the first argument. The FTAIA, adopted in 1982, seeks to make clear to American exporters (and to firms doing business abroad) that the Sherman Act does not prevent them from entering into business arrangements (say, joint-selling arrangements), however anticompetitive, as long as those arrangements adversely affect only foreign markets, but the FTAIA restores the Sherman Act's applicability to two categories of foreign anticompetitive conduct: (1) foreign anticompetitive conduct 'involving . . . [US] import trade or import commerce'; and (2) foreign anticompetitive conduct that 'has a direct, substantial, and reasonably foreseeable effect' on US domestic or import trade or commerce.

The court then examined whether the complaint contained sufficient factual content to support a plausible inference that the defendants' alleged anticompetitive activity – all of which occurred overseas – either 'involv[ed] . . . [US] import trade or import commerce' or had a 'direct, substantial, and reasonably foreseeable effect' on US domestic or import commerce. Since it was not alleged that the potash export cartel involved export to the United States, the only question was whether the Canadian export cartel had a 'direct, substantial, and reasonably foreseeable effect' on US imports. The court then held that the complaint failed to provide any factual description of the way in which prices in China, Brazil and India served as a 'benchmark' for American prices and that it thus failed to permit a plausible inference that the defendants' anticompetitive conduct in these foreign markets has a direct, substantial, and reasonably foreseeable effect on potash prices in the United States.

One could argue with the Court of Appeals judgement that the complaint did not contain evidence of the fact that international potash producers themselves considered that the export prices to India, China or Brazil acted as benchmarks for the rest of the world, and in particular, the United States.¹⁰ In any case, this example shows the formidable legal challenges faced by indirect victims of export cartels even in jurisdictions with well developed antitrust laws.

5.2 Can direct victims use the antitrust law of their country to fight foreign export cartels?

Countries that are directly targeted by export cartels may be in a weak position to fight such practices when they do not have any alternative source of supply of the product sold by the cartel members. In such cases, applying their domestic competition law (assuming that they can legally do this and assuming that they are able to gather the necessary evidence) may expose them to the risk of seeing a disruption of import flows if the export-cartel members sanctioned seek to punish the importing country. Antitrust enforcement may also prove to be useless if the buyers are in a weak bargaining position and the cartel members not only continue their practice after having been sanctioned but also pass on any

¹⁰ It should be noted that in November 2011 the seventh Circuit has granted rehearing en banc in this case. So there is still some hope that this judgement will be reversed.

monetary sanction by increasing the price of their exports to their customers in the country which has been brash enough to sanction them.

It is interesting in this regard to compare the passivity of the Indian government with regard to the potash cartel (no competition proceedings have been opened in India against the potash producers of Canada or Eastern Europe) with its activism regarding the American Natural Soda Ash Corporation (ANSAC), a Webb-Pomerene export cartel that was prosecuted in India.

In June 1997 and in 2000, the Indian Monopolies and Restrictive Trade Practices (MRTP) Commission held that ANSAC was a cartel carrying out part of its trade practices in India, giving the Commission jurisdiction under Section 14 of the Act. In July 2000 the Indian Supreme Court overturned the MRTP Commission orders because it held that the MRTP Act did not give it extraterritorial jurisdiction and that it could not, therefore, take action against foreign cartels or the pricing of exports to India, nor could it restrict imports. In 2002, a Competition Act replaced the MRTP Act with a provision allowing the Competition Commission (successor to the MRTP Commission) 'to grant a temporary injunction restraining any party from importing goods, if it could be established that such imports would contravene the Act's substantive provisions'.

One of the reasons which might explain the difference in treatment between the potash export cartel and the soda ash export cartel by the Indian competition authorities is that India has a domestic industry producing soda ash whereas it does not have any domestic source of potash and is therefore entirely dependent on Canadian, Belarus and Russian export cartels to secure much needed potash fertilizers. Whereas it can to a certain extent substitute its domestic supply of soda ash for imports, it is entirely dependent on potash imports and these imports are crucial to meeting the food needs of India's population. In this context, sanctioning the potash cartel by applying domestic competition law may create more problems than it solves both because the cartelists may be tempted to increase their export prices to India in order to recover any monetary fine imposed on them and because there is no easily available mechanism to ensure that sanctioning the cartel will deter the cartelists from fixing prices in India in the future.

Indian authorities have thus very limited means to fight the practices of the export cartels from Canada, Belarus and Russia. Their only real possibility of fighting the abusively high prices of export cartels which target India is to withdraw imports on a temporary basis, and have farmers delay fertilizer application, which they did in 2009 and threatened to do in 2010, but the potash producers are acutely aware of the fact that India cannot withhold its purchases of potash for very long without endangering its crops.

China is in a different position from India. China has a domestic potash industry and only imports part of its needs. It thus has more possibilities to trade off

domestic production for imports in the middle run even though in the long run it will clearly face a capacity constraint. China's potash production has steadily increased, reaching 3.5 million tonnes in 2010, a record high. The Chinese potash industry also has the technology and the know how to develop potash exploration and exploitation in Asia (for example in Laos) and in Africa (for example in Congo where Beijing-based Evergreen Industries acquired MagIndustries, which was aiming, through its Mentosh potash project, to establish a mine that would have a 28 year mine life with an annual output of 600,000 tonnes a year). Since it is not in the cartelists' interest to see the Chinese potash industry develop and become a competitor, they have an incentive to be more accommodating with their Chinese customers.

Even if it has more possibilities than India to sanction the potash cartel which victimises its agriculture, China has not used its competition law to attack directly the Canadian or Eastern European potash producers.

China may have different reasons not to intervene directly against this cartel. One possible reason for China not to challenge directly the Canadian export cartel is that the Chinese government sponsors export cartels for primary products and for other products and that it is therefore fearful of endangering its own export cartels.

In recent years, there have been allegations that the Chinese government has encouraged or organised at least two export cartels, one for vitamin C and the other for rare earth. The evidence regarding the Chinese vitamins export cartel surfaced in the proceedings following a lawsuit that originate in 2004 by a group of US vitamin buyers, including Ranis Co and Animal Science Research Inc, which sued Chinese companies Hebei Welcome, Jiangsu Jiangshan, Northeast Pharmaceutical Group (NEPG) and Weisheng Pharmaceutical Co for allegedly forming a cartel to set prices and limit supplies of vitamin C to the US market.

Court petitions (see Longstreth, 2011a and 2011b; and Su, 2008) stated that in December 2001, the four Chinese companies which at the time controlled 6% of the US vitamin C market, formed a cartel after meeting with the Association of Importers and Exporters of Medicines and Health Products of China. The petitioners allege that the four Chinese manufacturers signed a written production and price agreement. This pact explicitly limited each company to a specific volume for export. According to the plaintiffs, after the agreement was made, spot prices for vitamin C shot to as high as \$7 per kilogramme in December 2002 from \$2.50 per kilogramme in December 2001. And since then, the plaintiffs claim, Chinese companies have continued operating a cartel.

The defendants filed a motion for dismissal using the foreign sovereign-compulsion doctrine, which protects foreign companies that were compelled by their own government to break US law. Their motion was supported by an *amicus curiae* from China's Ministry of Commerce. The Chinese Ministry of

Commerce argued that the Chinese government supervised the price-fixing as part of its effort to 'play a central role in China's shift from a command economy to a market economy' and in order to mitigate the exposure Chinese companies faced in potential antidumping investigations. More specifically, it claimed that the vitamin C manufacturers had been compelled by Chinese law to coordinate their production and pricing and that a ruling against them would 'improperly penalise' them for 'the sovereign acts of their government and would adversely affect implementations of China's trade policy'.

On 6 September 2011 Brooklyn District Judge Brian Cogan rejected that defence, stating: 'The Chinese law relied upon by defendants did not compel their illegal conduct'.¹¹ But there are other cases where the involvement of the Chinese government in the establishment of export cartels is clearer (*China Daily*, 2011). For example, it was widely reported in February 2010 that China, which controls more than 95% of the global production of rare earth, a collective name for 17 minerals used in advanced technology from mobile phones to military equipment, announced that it intended to impose restrictions on rare earth mining over the next five years while maintaining international cooperation on trade in the metals, including 'reasonable' export quotas. The Xinhua news agency reported that '[t]he industry should maintain rational production and inventory control, make better use of domestic and overseas markets and resources, and have active international cooperation for a healthy and sustainable development'. It had reduced its exports by about 35% in 2010 compared to 2009.

A second possible reason for the Chinese competition authority not to challenge directly the potash export cartel may be that antitrust authorities find that they have more to lose than to gain politically by using their limited resources to prosecute foreign export cartels directed at their country. In particular, they may fear that if they do so, the authorities of other countries will retaliate by doing the same. National competition authorities may then find themselves in the unenviable position of being (at least indirectly) responsible for the prosecution abroad of some of their domestic firms (for having engaged in practices which are not illegal under their domestic competition law) and, in addition, of being asked to cooperate to secure the evidence needed for the conviction of their domestic firms abroad.

Interestingly, in the case of China, it seems that Chinese authorities used an indirect avenue to fight the potash cartel rather than attacking it directly. In the spring of 2011, the Anti-Monopoly Bureau of China's Ministry of Commerce

11 Irrespective of the future of this case (and of two other price-fixing cases in which Chinese companies have raised the sovereign compulsion defence), there was speculation in the press that the possibility of the Chinese government's participation in the cartel may have explained why neither the US Department of Justice nor the US Federal Trade Commission have taken any action against the Chinese companies. According to enforcement guidelines that the US government issued in 1995, the DOJ and FTC will not take action against a company if a foreign government makes a sufficiently detailed presentation that a specific law compelled the defendant's actions. If this was the reason for the US Antitrust Authorities not prosecuting the Chinese vitamins export cartel, this justification is now lacking since a US judge has found that the firms were not compelled by their government.

(Mofcom) used its merger control powers and examined the proposed US\$7.8 billion merger of Russian potash producers Uralkali and Silvinit. On June 2 2011, Mofcom announced that it had cleared the merger subject to behavioural conditions. Under the terms of Mofcom's approval decision, the merged entity is, first, required to maintain its established sales process and procedures when supplying potassium chloride to customers in China, including by maintaining direct trade and supply via rail or sea in a reliable and diligent manner. Second, the merged entity must continue to meet the demands of China's customers (including those in agricultural, general and 'special' industries) for potassium chloride – both in terms of product volume and product range. And, third, in relation to price negotiations with customers in China, the merged entity must continue to utilise traditional negotiation procedures with such customers and take account of the historical and current trading situation as well as the unique features of the Chinese market. Furthermore, the merged company is also required to appoint a monitoring trustee to report to Mofcom every six months (or upon being requested to do so by Mofcom) on fulfilment of these conditions, and Mofcom retains the right to impose sanctions for any failure to comply. As a commentator (Mayer Brown 2011) observed:

By requiring the merged entity to maintain current levels of sales and supplies to customers in China, and to continue utilising existing price negotiation procedures, Mofcom will have eased any concerns these customers may have had about the potential for price rises and increased disparity in their bargaining power with suppliers of potassium chloride. This issue is likely to have been a significant one in the eyes of Mofcom officials, given the importance of agricultural fertiliser to China's economy and food production stability.

In other words, China (which imports a very substantial part of its potash from Eastern Europe) in fact used its merger control powers to protect itself against the cartel and to monitor it in the future. While it did not attempt to eradicate it altogether it imposed conditions which will ensure that it will get preferential treatment and that Eastern European producers will not further reduce output to increase prices.

6 A multilateral solution to export cartels?

Even if, as we saw, China was able to protect itself to a limited extent against the effects of the potash cartel, it remains clear that, in many countries that are victims of foreign export cartels, competition authorities are not in the position to fight such cartels, even though these cartels impose huge costs on their economies.

If domestic competition laws and cooperation agreements between competition authorities are often unable to fight export cartels effectively, then what, if anything, can be done about these cartels at a multilateral level? A number of suggestions have been made, but authors differ on the scope of measures to be taken to fight anticompetitive export cartels and on the means by which such export cartels could be discouraged.

First, there are different views on whether government-sponsored export cartels should be treated the same way as private export cartels. Second, if most authors argue that the exemption from domestic competition laws for export cartels should be repealed, some authors argue that this exemption should be replaced by a notification procedure. Third, there are different views as to whether an international agreement on competition should ban private export cartels *per se* or whether it should only prohibit export cartels when it is established that they do not have pro-competitive effects on international markets. Fourth, if there should be an international agreement on prohibiting export cartels, there are differences of opinion as to whether it should apply equally to developing and developed countries.

Atwood (1987) suggests that a distinction should be made between government-sponsored export cartels and private export cartels. Government export cartels should not be liable to scrutiny under the domestic competition law of the importing country but should be a matter for international negotiation for governments. Atwood also advocates enhanced transparency for such cartels. He states:

The United States–Australia agreement was correct in recognising that each country has important and legitimate sovereign interests in the exportation of its natural resources or of goods manufactured or produced within its borders. What was implied by that agreement should be adopted by the United States on a broader and more open basis: Disputes over the activities of government sanctioned export cartels should be addressed on a government-to-government basis rather than through litigation in national courts under national rules. The requirement that export cartels be publicly registered under an appropriate national law provides an important element of transparency and an opportunity for government-to-government discussions, if desired. It also provides some assurance that the cartel exists and is conducting its operation in conformity with the laws and policies of the local government, an important factor in the rule of reason approach to jurisdiction.

Immenga (1995) shares the view that statutory antitrust exemptions enabling and promoting export cartels should be regarded as trade restraints and, therefore, be subject to international trade approaches. But he would limit this exemption to cases where exporting firms are compelled by the exporting state. In this case, firms would be immune from foreign competition law because the restriction

was actually caused by the state. Other authors have asked whether immunity should not be extended to cases of cartels which are encouraged by governments without being mandated.

Messerlin (1994) argues for a general *per se* ban against export cartels or for a repeal of the explicit or tacit exemption of export cartels in competition law. The reason offered is that exempting export cartels from competition law is likely to lead to 'a downward spiral or beggar-thy-neighbour dynamic through reciprocal measures that in the long run reduce both national and global welfare', as Trebilcock *et al* (2002) note. It is worth remarking that a general ban on export cartels could be justified in the context of the WTO by reference to the principle of national treatment.

Another set of authors recognises that whereas export cartels can significantly harm trading countries, they may allow small- or medium-size firms to gain access to world markets. They propose that an international agreement on export cartels replace the *per se* ban on cartels typical of national competition laws with a rule-of-reason approach.

For example Paul Victor (1992), endorses an ABA Antitrust Section Special Committee on International Antitrust proposal for an agreement on export cartels in the following way:

[T]he Committee's primary recommendation is that all countries enter into an agreement to repeal their statutes granting antitrust immunity to export cartels, at least to the extent that the statutes allow conduct in or into foreign markets that would be unlawful in their domestic markets. Such conduct includes such practices as price-fixing and market division that would be considered to be hard core antitrust violations in the United States.

At the same time, export cartel laws may properly protect certain joint conduct that may be efficiency enhancing and that may be lawful in the domestic market.

Given each nation's incentives to overlook possible anticompetitive effects of proposed export ventures in foreign markets, the Committee believes it would be worthwhile to give affected foreign parties, including foreign governments and private parties, an opportunity to participate in some manner in any domestic approval process. For example, if a country establishes a notification procedure for export ventures, there could be a mechanism for either the venturers or the recipient government agency to provide a copy of the notification to other countries with whom an agreement had been reached regarding export cartel policy. If a certification/immunisation mechanism were established, foreign governments and firms could be given the opportunity to submit comments or formal objections

to the decision maker, and possibly to appeal the initial decision to higher levels in the executive or judicial branch, where appropriate.

Along somewhat similar lines, Levenstein and Suslow (2004) state:

International cooperation provides an alternative that, if wisely implemented, could limit the negative effects of collusion on international markets without providing a regulatory incentive to merger for small firms, especially in small or developing countries. Such an agreement could require that competition officials meet a higher standard to show that the cooperative activity did in fact harm competition in some markets rather than the per se standard which has become more common in the national laws of most high income countries. This policy would recognise that export associations may provide essential resources to overcome barriers to entry to export markets and therefore increase the competitiveness of international markets. Rules should be established to give firms guidance as to whether their activity is likely to meet international competition standards, as one of the benefits of national export exemptions has been to provide legitimate marketing associations assurance that they would not face domestic legal liability. A stronger policy would put the burden of proof on export associations to show that they need to cooperate to participate effectively in international markets and that their activities indeed do not undermine competition.

F M Scherer (1996) warns us that a general ban on export cartels of mineral or agricultural commodities would be difficult to accept for developing countries even if, as we have seen previously, they can be the victims of such cartels. As he puts it:

For many less-developed countries, the export of primary agricultural or mineral commodities is the principal source of earnings from international trade. How such primary commodity trade would be treated under an international competition policy agreement would be of great concern. It is reasonable to believe that the leading oil exporting nations would refuse to ratify a competition policy accord if they were deprived of the ability to participate in OPEC, however poorly adhered OPEC's price and quota agreements have been in recent years. Similar opt-out decisions could be expected from Malaysia if it could not participate in a tin cartel, Jamaica to maintain bauxite cartel possibilities, Brazil to preserve coffee cartel arrangements, Ghana to maintain a cocoa bean cartel, Russia and South Africa to cooperate with the De Beers syndicate, and perhaps even Canada to maintain the possibility of uranium and potash cartels.

Scherer offers several suggestions to overcome this difficulty. In the first place, he reminds us that the draft of the Havana Charter treaty included provisions to exempt from its main anti cartel thrust intergovernmental agreements to set

and stabilise the prices of primary commodities, defined as ‘any product of farm, forest, or fishery or any mineral’ in its natural or preliminarily processed form’. Such agreements would have been authorised only when the International Trade Organization concluded that one or the other of two circumstances had developed or was expected to develop: either a ‘burdensome surplus’ which ‘would cause serious hardship to producers among whom are small producers who account for a substantial portion of the total output, and that these conditions could not be corrected by normal market forces in time to prevent such hardship, because, characteristically ... a substantial reduction in price does not readily lead to a significant increase in consumption or to a significant decrease in production ... or widespread unemployment or under-employment, which, in the absence of specific governmental action, would not be corrected by normal market forces in time to prevent widespread and undue hardship to workers’.

Scherer also makes a proposal of his own to facilitate an agreement on the ban of export cartels. Under his proposal, each signatory nation would be allowed to exempt from the export cartel prohibition three industries, each defined no more broadly than a single four-digit SITC category with the possibility that the exemption could be reduced progressively to two industries, then one and ultimately to zero. Scherer notes that his proposal to exempt a fixed number of industries is deliberately biased in favour of LDCs, whose exports are likely to be concentrated over a narrower array of industry categories than those of highly industrialised nations.

A number of authors suggest that if there were an agreement on a *per se* ban on exemptions for private export cartels, it should not apply equally to developing and developed countries, or that the effective enforcement of such a ban should be primarily the responsibility of developed countries.

Ajit Singh, for example, argues that firms from developing countries need to coordinate in order to benefit from the economies of scale which will make them able to compete with multinational corporations on world markets. He therefore calls for special and differential treatment for developing countries in the area of export cartels. But he considers that developed countries should ban export cartels by firms based in their territories that exploit developing countries.

Hoekman and Mavroidis (2002) also argue that developed countries should have responsibility in the fight against exploitative export cartels because of the lack of resources of competition authorities in developing countries to sanction these cartels. According to them, ‘what is needed is a ban on export cartels – including instances of alleged abuse of monopsony power by large buyers on the world market – and a commitment on the part of OECD members to enforce such a ban. From a development perspective such an approach would ensure that WTO antitrust disciplines have a direct payoff by dealing with practices that national authorities in developing countries will find difficult, if not impossible, to address by themselves – even if they have antitrust’.

Hoekman and Saggi (2007) suggest that developed countries with sophisticated antitrust authorities should alter their legislation so as to ban export cartels (and similar practices), even if these cartels have no overt effects on their own markets in exchange for low income countries offering them a mix of market-access commitments and transfers. They show that a mutually beneficial deal of this type can indeed be struck, and that the scope for cooperation is higher when LICs can use both carrots (transfers) as well as sticks (tariffs). Any tariff commitments/bindings (whether past or new) could then be reversed in cases where high-income countries violate their obligations to ban export cartels.

Finally, Dani Sokol (2009) takes a different stand, trying to avoid the pitfalls of hard law and soft law. He suggests the negotiation, in the context of the WTO, of a mandatory transparency requirement for export cartel: 'Countries would require legitimate export joint venture (even those with only an implicit exemption) to undertake a robust business review clearance from their home jurisdiction that would provide immunity for a set period of time based on the proposed business plan. Business review clearance would be publicly available. To have the immunity renewed past the initial period, companies involved in the joint venture would be required to provide evidence that the venture is not participating in anticompetitive activities abroad'. According to Sokol, mandatory transparency would allow importing jurisdictions a further check on the activities of joint exporting firms that may be causing an anticompetitive effect and this would particularly assist developing world agencies in obtaining information as to the potential anticompetitive effects of export cartels in their jurisdictions.

7 Conclusion

The reasons for the recent increases in the price of mineral and agricultural products are numerous. It is clear that export cartels, whether sponsored or mandated by governments or purely private, have been in a number of cases a contributing factor to maintaining the prices of such products at artificially high levels, thus penalising the importing countries. The example of the potash market is revealing, with India and China being among the largest victims and Canada, Russia, and Belarus being the benefiting countries.

Export cartels are often explicitly or implicitly exempted from domestic competition laws of exporting countries. National competition authorities of the exporting countries are thus not able to fight such practices. Competition authorities from the importing countries, particularly developing countries, are often also unable to apply their domestic competition laws because they do not have extraterritorial powers of investigation. Furthermore, even when a competition authority from an importing country has the possibility of applying its domestic competition law to the damaging export cartel, it may not be in a

position to do so if the export cartel was mandated or organised by a foreign government or if it is subjected to government pressures not to intervene for fear of endangering export cartels originating in its own country.

Solutions to the problem raised by export cartels thus require a combination of trade and competition instruments. Banning all export cartels seems to be unachievable and possibly unwise as there is the possibility that export cartels in some cases have a pro-competitive effect by allowing firms which would not have individually access to the international market to export. Also it must be recognised that both developed and developing countries may in some circumstances have an interest in promoting or allowing some export cartels among their domestic firms and may in other circumstances be the victims of foreign export cartels.

Under those circumstances, making countries pay for the privilege of having government-supported export cartels in a multilateral framework may be a better and more flexible way to address the trade side of the issue. Trading countries will restrain from engaging into state supported export cartels if the retaliations against them from the importing countries through withdrawing trade concessions become too expensive. On the competition side, an agreement to repeal the explicit exemptions from competition law of private export cartel is a necessary, but not sufficient, condition to eliminate them. A mandatory monitoring and transparency agreement whereby competition authorities of exporting countries would review private export cartels whenever requested by competition authorities of importing countries and would make the relevant information available to these competition authorities would be a useful complement.

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7 Reducing Distortions in International Commodity Markets

An Agenda for Multilateral Cooperation¹

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Introduction

World commodity markets – and particularly the markets for agricultural commodities – remain highly distorted despite the wave of liberalisation that has swept world trade since the 1980s. These markets are distorted on both the export and the import side, with serious implications for world prices and their volatility. Market failures abound in the production of many commodities. These include inadequate pricing of many common-pool resources, externalities associated with the extraction and use of commodities such as fossil fuels, and massive externalities associated with the production of many agricultural, forestry and fish products. Very few of the price distortions found in commodity markets can be justified as dealing with such market failures, although ex post justifications along these lines are sometimes offered. Rather, most of these distortions are designed to achieve redistributions of income by raising or lowering prices in a way that will transfer resources to favoured groups. To the extent that they do contribute to reducing any of the problems of market failure, this is typically coincidental.

There remains much that can be done at national, regional and global levels to reduce the existing distortions and improve outcomes worldwide – ideally in conjunction with introducing policies to reduce the adverse consequences of the profound market failures existing in many markets. However, without an understanding of the forms, objectives and effects of the various interventions by governments, it will be very difficult to secure reform that will enhance world

¹ An earlier version of this paper was presented at the Symposium on Trade and Primary Product Markets and Competition Policy, Geneva, 22 September 2011. We are grateful to Simon Evenett, Ian Gillson and participants in the symposium for helpful comments. The views in this paper are personal and should not be attributed to the World Bank.

welfare. The objectives of these national policies are frequently quite complex and non-transparent. In many cases, there are multiple objectives, such as raising or lowering the average level of a commodity price, but also reducing its variability. Tracing through the effects can also be complex, with ultimate impacts frequently quite different than they might at first appear. Since the effects of various measures are often interdependent and instruments may be strongly substitutable, we take a broad approach in inventorying the policies used. Reform efforts require a good understanding of the objectives and political economy forces influencing policies in a particular area, or reform is likely to encounter unexpected resistance. The same applies to efforts to design and negotiate new international disciplines that aim to reduce the negative cross-border pecuniary spillovers created by national policies.

In this chapter, we first provide a description of the broad types of intervention prevailing in and affecting global commodity markets. We begin in Section 1 with a discussion of the most common type of intervention in commodity markets: actions designed to affect the domestic price of a commodity relative to its international price. Most attention with this type of measure has focused on interventions designed to increase the level of the domestic price relative to the international price using instruments such as tariffs. However, there are also many types of intervention designed to reduce domestic prices relative to international prices in order, for example, to lower the price of an input used in a politically powerful industry. In Section 2, we discuss another politically important type of intervention: measures aimed at reducing the volatility of domestic prices relative to world prices. In Section 3, we turn to a discussion of the implications for multilateral cooperation and rule-making efforts. Section 4 concludes.

1. Measures affecting the level of prices

Measures designed to affect the level of commodity prices have received the most attention in the economic literature because of their prevalence. These measures can be divided into those that attempt to influence the domestic price relative to external prices, and those – mostly on the export side – that seek to influence the level of world prices. There is a dizzying array of measures of this type, many of which have been used for a very long time.² A brief list of major measures of these types is given in Table 1. All of these instruments affect trade, acting on either volumes or prices.

² For a partial list of measures used or envisaged in the 18th century, see Hamilton (1791).

Table 1 Some measures designed to influence commodity price levels

Policy instrument	Import side	Export side
Border measures	Import duties/subsidies	Export taxes/subsidies
Quantitative restrictions	Quotas, licenses, <i>etc.</i>	Export restrictions/bans
Public monopoly	State trading	State trading
Competition policy	Anti-cartel enforcement; parallel imports/exhaustion regime	Antitrust exemptions for private export cartels
Contingent protection	Antidumping, safeguards	
International agreements		Export cartels
Production controls		Production cartels
Subsidies	Production subsidies	Export subsidies

A huge literature has emerged seeking to understand the reasons behind the use of measures designed to change the level of domestic prices relative to world prices. Two broad explanations for the emergence of trade barriers have been identified. The first focuses on the political economy factors that influence the level and the economic costs of protection. The second considers the terms-of-trade implications of trade barriers.³

The political economy explanation for protection relies on the fact that some producers are better organised to seek support from governments than are other sectors, and consumers. The political economy explanation is relevant to a variety of underlying objectives.⁴ In practice, a common objective of groups seeking support is to increase domestic economic activity, and this can be pursued through a mix of instruments, ranging from import protection to taxation of exports of inputs used by an industry. Thus, we include under this heading industrial policy arguments and objectives. While policymakers recognise that protection creates economic inefficiencies and costs, the political economy benefits to them are believed to outweigh these costs enough to generate substantial rates of protection, even when the benefits to politicians of campaign contributions are only modestly higher than their perceptions of the social costs of protection (Goldberg and Maggi, 1999).⁵ Negotiations over import protection to a particular industry also tend to be heavily influenced by the specific situation of that industry, without taking into account the general-equilibrium implications for other sectors. However, the cumulative effect of decisions to grant protection to industries that are collectively important is to impose cost burdens on the exporting sectors, both directly by raising the costs of (protected) inputs and indirectly by raising the prices of non-traded goods.

3 In this chapter, we abstract from revenue considerations as a motivation for taxation of trade. In practice, trade is often an important source of revenue for governments of low income countries.

4 The common element underpinning the intervention in trade is to move away from a neutral incentive regime, ie to differentiate between sectors in terms of the effective taxation they confront.

5 The framework often used for political economy analyses of trade policy is Grossman and Helpman (1994). See Gawande and Hoekman (2006) for an application of the Grossman-Helpman framework to agricultural policies in the United States.

International trade negotiations can change the political economy balance by causing export interests that are adversely affected by protection to become engaged in the political process (Anderson, 2010).

Protection may also be motivated by a desire to benefit at the expense of foreigners. Import protection may generate a benefit to the country by reducing the price that it pays suppliers for imported goods. The cumulative effect of import protection, or the direct effect of export taxation, may be to increase the prices received for exported goods (Broda *et al*, 2008). If a country possesses monopoly power for a product, some type of export restraint will be optimal from the perspective of maximising national welfare. Whether it does so depends on whether the government is able to determine the right level of the restriction, which will be a function of the elasticity of demand for product, the existence of substitutes, *etc.* While the use of export restraints in situations where a country has market power may make economic sense – Tarr (2010), for example, concludes that the export taxes that are imposed by the Russian Federation on natural gas very substantially benefit Russia and raise Russian welfare – it is easy to get it wrong. Thus, Tarr (2010) also finds that the optimal export tax on timber for Russia – another product in which the country has the ability to influence world prices – is around 12%, half the level of what was being imposed in 2009 and much less than the 80% level that was proposed by the government.

Whether import duties and export taxes are explained by political economy or terms-of-trade arguments, the determinants of these measures tend to be couched in terms of levels. The Grossman-Helpman (1994) model, for instance, explains high rates of protection in terms of generally stable factors such as the import demand elasticity (which influences the cost of providing protection); the share of domestic output in total production (which determines how much of the benefit of the protection provided accrues to interest groups, rather than the national budget); and whether the sector is organised to lobby for protection. Where export barriers are used for political economy reasons – as, for example, to drive down the price of a commodity used as an input by a more politically powerful ‘preferred’ sector – the same stability in tax rates is likely expected. If policy is driven by terms-of-trade objectives, protection will be higher in commodities for which the foreign elasticity of export supply is low (and hence an import barrier will improve national income by reducing import prices to a greater degree). Similar arguments apply to export restrictions used to improve the terms of trade and to measures resulting from imperfect competition.

Quantitative restrictions, including bans on imports or exports, are sometimes used to restrain trade. Relative to price-based measures such as tariffs or export taxes, they have the disadvantage that their impacts on domestic prices are non-transparent. It is difficult to know, for example, how much an import quota of 1,000 tonnes restricts trade and raises prices. Only by converting it into an import tariff equivalent can we begin to gauge how much it restricts trade. Even if a quota has roughly the initially desired degree of trade restrictiveness, the

extent to which it restricts trade can change sharply as the domestic demand or supply changes in response to subsequent shocks. When a quota or license becomes restrictive of trade, it becomes valuable. While the allocation of quotas or licenses in this situation can be a way to compensate domestic losers and achieve policy reform, this process does not raise government revenues, and can easily result in corruption.

State-trading systems, under which the right to trade is allocated only to one or a few firms, are frequently used to manage agricultural trade. When these firms are directly controlled by the government, the resulting system can operate just like a quota regime, with the government choosing the quantity to be imported or exported.⁶ If the firms have autonomy in the amounts they trade, the outcome may involve reductions in the volume of trade that depend upon the firms' perceptions about the elasticity of market demand, and their conjectures about the behaviour of their competitors (McCorriston and MacLaren, 2011). Such arrangements may involve the state-trading enterprise setting prices on the input side (*eg*, credit, seeds, transport) as well as for the output that is produced. Under GATT rules, any regime in which firms have exclusive or special privileges in trading is classified as a state-trading regime and must abide by the non-discrimination rules (WTO, 1995, p. 509).⁷

Where monopolies or oligopolies in trade arise in the absence of government privileges – perhaps because of the size of the market – there may be similar issues to those arising with state-trading enterprises. In this case, however, in principle the threat of entry provides an important check on the exploitation of market power, and national competition legislation (antitrust enforcement) can be used to discipline illegal restrictive business practices. As has been documented extensively, commodity value chains are characterised by imperfect competitive market structures (*e.g.*, Connor, 2003). Domestic processors, for example, often have a degree of market power, as do suppliers of certain types of inputs (seeds, fertilizers, chemicals) – a number of which have formed international cartels at different points in time, including in recent years (Bolotova *et al*, 2005). Similar economic effects can arise from the (non-)application of antitrust law as derive from trade policies affecting exports and imports. Examples include exemptions for national firms for behaviour on export markets – such as export cartels – that would otherwise be illegal, as long as the actions do not have negative effects on consumers in the home market, and the extra-territorial application of antitrust law for the benefit of national consumers. In recent years, increasing attention has been given in policy circles to potential competition concerns arising from

6 Irwin (1996) points out that the term 'free trade' originally emerged in parliamentary debates at the end of the 16th century as an antonym for trade conducted through firms given trading rights by the government, rather than as a goal of trade not subject to measures such as tariffs.

7 See Hoekman and Trachtman (2008) for a discussion of a case brought against the Canadian Wheat Board and the reach of the applicable WTO rules. The Appellate Body has ruled that WTO rules do not imply 'comprehensive competition-law-type obligations' on state-trading enterprises (WTO, 2004b, para. 145).

the expansion of global value chains and increasing concentration at specific segments of such chains. We come back to this below.

Contingent protection measures such as antidumping, safeguards and countervailing duties are typically used less frequently in markets for agricultural and mineral commodities than for manufactures. They are, however, widely used in markets for products such as chemicals, for which the marginal costs of production are low and prices volatile, and hence likely to fall frequently below the overall cost of production.⁸

Production and export quotas were central elements of the International Commodity Agreements administered by UNCTAD (Rieber, 1985; Raffaelli, 1995). They were used in an attempt to restrict the supply of commodities and, hence, to raise their world prices, driven in part by the Prebisch-Singer argument that demand for commodities was income-inelastic and that the terms of trade for commodity exporters would therefore decline over time as countries grow richer. Much of the concern in the 1970s about price levels appears to have been based on the view that high rates of technological change were driving down prices and therefore creating problems for producers – a concern that seems surprising when one recalls that productivity growth lowers production costs.⁹ Typically, they were coupled with buffer stock arrangements intended to stabilise prices in the short term. Production and export quotas created serious problems of allocating and enforcing quotas, given strong incentives to cheat on reduction commitments. The buffer stocks proved much more difficult to use for price stabilisation, given declining prices for most of the period, with excessive accumulation of stocks almost invariably occurring at some stage. These agreements were introduced for a wide range of commodities, including coffee, cocoa, rubber and sugar. As discussed by Williams and Wright (1991), the buffer stock elements of these schemes frequently suffered from explosive accumulation of stocks and all schemes of this type ultimately failed, as did similar schemes such as the Reserve Price scheme for wool in Australia.

Subsidies have been used extensively to support farmers in OECD countries. While output-based subsidies distort production, research suggests they have a much smaller impact on world prices than border measures. Hoekman, Ng and Olarreaga (2004) and Anderson, Martin and Valenzuela (2006) estimate that border barriers accounted for 80–90% of the impact on world prices and, thus, welfare. Subsidies expand domestic production, in the process reducing imports by lowering the cost (price) of domestic output. In the absence of border barriers, the effect of a production subsidy to domestic producers is to expand output by raising returns per unit of output. While imports fall, domestic prices are unaffected, absent border measures, as is total domestic consumption, so there

⁸ See Bown (2011) for recent analyses of the use of contingent protection by different jurisdictions.

⁹ The effect of technical change on producer profits depends on the nature of the technical change and that, with some types of technical change, producer gains from cost reduction may be less than the losses resulting from price declines (Martin and Alston, 1997; Ivanic and Martin, 2010).

is no consumer deadweight loss. Border protection on imports is also important for the potential magnitude of any export subsidies. Export subsidies that seek to raise the domestic price above import parity plus the tariff will likely be unsuccessful in doing so.

An important difference that characterises political economy from terms-of-trade motivated trade policy and related interventions in commodity markets is that, in the case of the former, the probability that intervention raises national welfare is lower than for the latter.¹⁰ Whatever the motivation, the interventions are likely to generate negative spillovers for other countries, giving rise to an incentive to cooperate and to negotiate reciprocally binding disciplines on the use of specific policies. However, as the terms-of-trade changes that result from large countries restricting exports or imports can generate benefits to an individual country, it will be necessary that any such cooperation compensates countries for the welfare losses they will incur by revoking their ability to impose the externality. In principle, international agreement can improve on the initial welfare of countries with the ability to affect their terms of trade (Bagwell and Staiger, 2011).¹¹ If policies are driven by political economy motivations, it may be the case that unilateral reforms offer the possibility of attaining the underlying objective at less cost to society.

1.1. Agricultural markets

For a number of reasons, many agricultural commodities tend to be protected relatively heavily in the industrial countries. These reasons include that: (i) food tends to be a small share of the consumption expenditures of consumers in these countries; (ii) many agricultural commodities are final goods, for which there is little countervailing pressure from organised using industries (other than processors who can pass on the higher costs); (iii) the number of farmers tends to be relatively small in high-income countries, making it relatively easy for them to coordinate in order to apply political pressure; and (iv) farmers in these countries are commercially oriented, selling virtually all of their output, and using substantial amounts of purchased intermediate inputs – creating leverage between their output prices and their net returns.

Historically, agricultural products in developing countries have tended to be taxed, for reasons that are the obverse of those applying in the high-income countries. These reasons include that: (i) food expenditures are frequently a

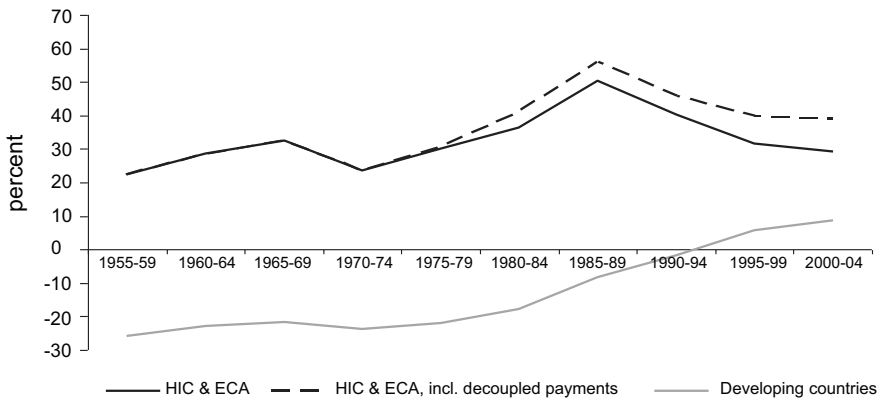
10 Although from a global point of view, improvements in the terms of trade are purely transfers, and removal of these barriers generally increases world income by reducing the efficiency costs of these distortions.

11 Unfortunately for those seeking to analyse the implications of trade reforms and inform the negotiating process, the distribution of these gains may be uneven. It is necessary to take into account the distribution of net gains for a complete assessment of the gains from any reform. Further, the gains from exploitation of terms of trade are national, rather than global, with international trade negotiations one approach to improving on the sub-optimal global equilibrium that may result from individual countries seeking to maximise their terms of trade.

large share of the income of most people; (ii) the number of farmers tends to be large, making it hard for them to organise politically; (iii) urban consumers are a relatively small group, able to organise on an issue like food prices; and (iv) farmers are mainly subsistence-oriented – selling only part of their output and using relatively few intermediate inputs. In some developing countries, taxation of agricultural exports has historically been an important source of revenues, one that was particularly important before the emergence of the value-added tax.

A recent comprehensive study of agricultural distortions led by Anderson (2009) shows that agricultural distortions in the industrial countries generally remain large, although there are signs that they may have begun to decline from their high levels in the mid-1980s. This is particularly the case when we consider the protection that is not decoupled from output decisions. In developing countries, the average rate of taxation of agriculture has declined sharply, as shown in Figure 1, and switched to modestly positive assistance. The changes in these rates of assistance reflect a dramatic sea change in the pattern of agricultural distortions in developing countries, perhaps related to the high rates of economic growth in developing countries in the latter period of the sample, and the sharp shift away from dependence on exports of commodities towards reliance on exports of manufactures.

Figure 1. Average nominal rates of assistance to agriculture, five-year average 1995–2004

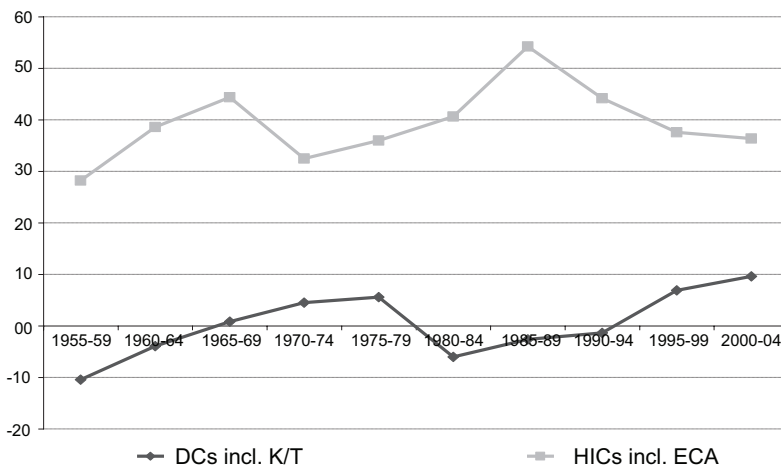


Source: www.worldbank.org/agdistortions.

The extent of taxation of developing countries in the early period of the sample is understated by the data on nominal rates of assistance presented in Figure 1, as the agricultural sector was also taxed indirectly by the protection provided to the non-agricultural sector. This raised input costs both directly through increases in the price of inputs, and indirectly through increases in the prices of non-traded goods and wages – the so-called real exchange appreciation resulting from protection. The full extent of the taxation of developing country agriculture is shown using the relative rate of assistance in Figure 2. This shows that a very

large share of the reduction in the total burden of taxation of agriculture reflects reductions in the protection provided to other sectors. Sub-Saharan Africa is, today, the only developing country region where farmers still confront net taxation relative to other sectors. Matters are made worse because of weaknesses in infrastructure, inefficient logistics, *etc.*, that result in high transport-related costs, reduce the pass-through of world market prices, and therefore reduce the extent to which higher prices benefit rural communities.¹² Prevailing market structures, including market power in downstream segments of the production/value chain, may also weaken the link between world and local farm gate prices for farmers, especially in developing countries.¹³

Figure 2. The relative rate of assistance to developing country agriculture, %



Source: Anderson (2009) and www.worldbank.org/agdistortions.

Within developing country agriculture, there is a sharp difference in the rates of protection provided to import-competing agriculture and to export-oriented agriculture, as shown in Figure 3. The almost complete elimination of taxation of agriculture has sharply reduced the cost of distortions on export-oriented agriculture in developing countries. The rise in protection to import-competing agriculture has substantially raised the costs associated with this form of protection, which is likely to be particularly costly to the poor, who spend a large share of their incomes on food.¹⁴

¹² See, for example, Aksoy and Hoekman (2010).

¹³ See, for example, McCorriston *et al* (2004), Sheldon (2006), Sexton *et al* (2007) and Porto *et al* (2011).

¹⁴ As is the case with any reform or price shock, there will be winners and losers – winners from higher food prices include producers in poor countries. Much also depends in the longer run on the supply response to higher prices.

Figure 3. Nominal rates of assistance to developing country agriculture by trade status, %

Source: Five-year averages from Anderson (2009) and www.worldbank.org/agdistortions.

Producer support estimates (PSEs) produced by the OECD provide a measure of the extent to which farmers are being assisted over time by governments through various payments and price support policies. The PSE expresses the monetary value of policy-induced transfers from consumers and taxpayers to producers and can be expressed as a percentage of gross farm receipts. Support to producers in high-income countries was estimated to be US\$227 billion in 2010, accounting for 18% of gross farm receipts – the lowest percentage on record (OECD, 2011). The changes in the levels of PSEs in 2010 were mostly driven by changes (often increases) in world prices and exchange rate movements. However, more than half of support to farmers continues to be delivered in ways that are highly distortive of trade and competition. The EU and China currently have the highest PSEs. Agricultural support levels have been increasing rapidly in China and are getting close to the OECD average in percentage terms (OECD, 2011).

Since September 2008, the introduction of trade restrictive measures on food has accounted for one quarter of all new trade restrictions imposed (Gillson and Datt, 2011). A noteworthy feature of trade policy action since then has been that countries have pursued liberalisation as well as protection, in an effort to lower prices for households and industries (Datt *et al*, 2011). Some countries increased their tariffs on food products substantially. For example, Russia increased tariffs to 50–80% on imports of pigs, pork and poultry. However, far more frequent in recent years have been tariff reductions on food imports as governments tried to contain domestic price increases. Half of all food tariff reductions were on grains and sugar. Export restrictions have also been used in attempts to stabilise domestic food prices, mainly affecting grains. The most frequent users of new food trade restrictions have been emerging market economies such as Russia, India, Indonesia and China. In a sample of 58 developing countries' policy

responses during the 2008 food crisis, some 40% lowered taxes on food, 30% controlled prices and/or resorted to consumer subsidies, and 20% introduced export restrictions (World Bank, 2009).

In recent years, analysts and policy advocates have raised concerns that changes in the supply chain and market organisation of commodities may impact on commodity price levels. For example, DFID *et al* (2004) argue that 'excessive concentration within input markets (such as seeds and agrochemicals) and output markets (trading, processing, manufacturing and retailing) can work against the interests of small producers in developing countries, either by creating barriers to market entry, or by worsening the terms on which they engage in trade.' The concern is that monopoly power of providers of inputs and/or monopsony power on the part of buyers (trading companies, retailers) lower domestic farm gate prices and/or result in retail prices that are higher than they would be if the relevant markets were characterised by greater competition.¹⁵

Since the 2008 food price spike, significant policy attention has been given to the question of whether changing market structures and food supply chains give rise to competition concerns because of excessive concentration/market power in certain parts of the supply chain – especially 'buyer power' by retailers. The EU launched a process of consultations with its members' national competition agencies on whether and how imperfect competition in the food supply chain is prevalent, driven by perceived asymmetries in the increases and reductions of the price of food products in response to changes in the world price of major agricultural commodities. The results of this consultation are summarised in EU (2009). Despite high concentration ratios at the retail level in many countries, the degree of competition was found to be intense, and no national competition authority saw a need for (or had taken) action against retailers for taking part in horizontal anticompetitive agreements or engaging in abuse of dominance.

While large retailers have buying power, in practice this is used in part to counteract the market power of major multinational food companies with strong brands. Insofar as retailers use their market power to bargain for better prices from suppliers that also have market power (the multinationals), the battle is over the distribution of rents.¹⁶ Market power at any stage of the value chain can be expected to affect the distribution of the rents that accrue to the agents that are involved in the chain. Thus, buyer power by retailers can be used to extract any rents from upstream producers – be they multinationals, wholesalers or farmers. However, while such rent shifting/extraction is obviously a matter that may be a policy concern and may motivate actions by either the upstream

15 The argument is summarised in a statement by the Special Rapporteur on the right to food (De Schutter, 2001), which argues that disproportionate buyer power, arising from excessive concentration of commodity buyers, food processors and retailers tends to depress prices for food, lowering incomes of farmers and wages of farm workers. See also Dodd and Asfaha (2008).

16 EU (2009) notes that in 2006, the average net profit margins of European retailers were around 4% as compared to margins for The Coca-Cola Company and Group Danone of some 20% and 11%, respectively.

producers or the government to affect their distribution, from a competition (national welfare) perspective what matters is whether the exercise of buyer power results in higher consumer retail prices. If the effect is to lower final prices, independent of the effects on upstream prices (profits), there is not a problem from a competition perspective – to the contrary.

Much depends, therefore, on whether exercise of market power along the value chain is likely to increase downstream prices. The exercise of monopsony power can be detrimental in this regard if it involves buying less from input suppliers (so as to reduce input prices paid), with the result that output available for downstream consumers is reduced, thereby generating higher prices. More generally, any cost savings may not be passed on to consumers. For this to occur, however, there needs to be limited competition or significant barriers to entry, while as noted, the retail sector is characterised by very vigorous price competition.¹⁷ The type of bilateral bargaining that occurs between large retailers and large producers of processed foods (multinationals) is unlikely to reduce output – in fact it may increase it by inducing suppliers to compensate for lower prices by producing more (OECD, 2009).

The focus of competition policy enforcement is on consumer welfare of the country concerned (or the European Union, in the case of the EU). Agencies do not have any scope to consider the effects of actions by firms on consumers in foreign markets outside their jurisdiction. That the operation of value chains might result in intense price pressure on farmers in developing countries is not a matter of concern to competition agencies in importing countries. It may provide a justification for a case to be brought by competition authorities in the country that produces the commodities concerned – *eg*, if processors impose onerous conditions on farmers, foreclose markets, *etc*. In practice, a non-competitive market structure along the production chain can have adverse price consequences for farmers. The absence of effective competition authorities in a country may result in lower output and investment by producers and raise prices for consumers.

In many developing countries, producers are smallholders who depend on a small number of buyers that have market power (oligopsony) and are thus able to extract some of the surplus that the export market generates. Porto *et al* (2011) find that greater competition among processors in a sample of African countries and export crops would benefit farmers by increasing farm gate prices. Matters are complicated, however, by the fact that buyers often also provide ancillary services and working capital (*eg*, seeds). Pervasive market failures such as lack of access to credit mean that, in practice, processors may provide inputs to farmers

¹⁷ One potential concern would be if the exercise of monopsony power lowers retail prices to such an extent that it forces competitors out of the market, allowing the surviving firm(s) to subsequently raise prices. As in the case of predation, the likelihood of such a scenario depends on the contestability of the market (which depends on factors such as how high entry and other fixed costs are). See Carstensen (2008) for a discussion of several antitrust cases that were brought in the US that involve allegations of anticompetitive effects from the exercise of buyer power.

in return for an agreement to buy their harvest at a negotiated price. Given weak capacity to enforce contracts through the legal system, the feasibility of such arrangements may depend on the buyers having some market power. Porto *et al* (2011) conclude that if such constraints (market failures) are taken into account, the benefits of greater competition are reduced, but the reductions relative to a benchmark without market failures are generally small. There are exceptions, however, indicating that careful analysis is needed of the operation of a given market in a country.¹⁸

1.2 Natural resource markets

As is true for agricultural markets, governments have a long history of intervening in markets for natural resources, both renewables and non-renewables. Contrary to policies that affect agriculture – where import protection has tended to dominate – in the case of natural resources the focus has been much more on export restrictions. Protection rates on imported non-agricultural commodities tend to be relatively low because many of these commodities are intermediate inputs, for which powerful user industries apply pressure against high rates of protection. On the export side, numerous countries have intervened on export markets in an effort either to raise export prices or to support specific industries. Export restrictions are sometimes also justified on environmental grounds, although any measures targeted efficiently to environmental problems would generally target production or consumption, rather than exports. Data reported in WTO (2010) suggest that it is mostly developing countries that implement export restrictions. Export taxes on natural resources account for about one third of all export taxes imposed – some 11% of world trade in natural resources is covered by such taxes, with timber, iron, copper, pearls and gemstones being among the most frequently affected.¹⁹

Although export restrictions are more frequently observed than import protection, the underlying motivations have been very similar, either exploiting market power (terms of trade) and/or political economy/industrial policy – an effort to subsidise/tax certain industries or activities. In cases where a country does not have the ability to affect its terms of trade, the objective underlying the use of export restrictions is frequently to subsidise the domestic processing or another downstream industry by providing it with access at less than world market prices. Such support to specific industries may also be granted through direct subsidies or tax concessions. Many energy producers subsidise domestic consumption by charging nationals below world market prices (*eg*, the Russian gas example analysed by Tarr, 2010). A key result is generally resource misallocation.

¹⁸ See Delpuech and Leblois (2011) for a recent example of such analysis.

¹⁹ Export restrictions on natural resource products accounted for one third of the 7,328 notified export restrictions in the time period covered by WTO (2010).

OPEC is of course the longest-standing example of an effort among producers to restrict/manage supply with a view to raising the level of the world oil price, using production quotas as a means to reduce output and stabilise prices. International agreements among producers to use export and production restrictions proved to be very difficult for virtually all other commodities (Raffaelli, 1995) because of conflicts between suppliers, and the emergence of new suppliers who – quite rationally – preferred to free-ride on any price-enhancing supply or export restrictions imposed by existing suppliers. OPEC has proved more successful than the other commodity agreements for several reasons, including: (i) a relatively small number of major exporters; and (ii) the fact that oil can be stored much more easily and economically than many other commodities – including simply by leaving more of it in the ground. While the specific instrument used to restrict output is a production quota, the frequent coupling of this measure with low consumer prices makes the policies of many producers more closely analogous to an export tax regime. Importing countries have responded to the formation of OPEC through the imposition of ‘countervailing’ taxes so as to ensure that some of the rents that are created by the resulting increase in global oil prices accrue to them.

As noted by Collier and Venables (2010), natural resource markets have a number of distinct features including the fixed location of resource endowments, the presence of resource rents (which can be large if world prices are far above marginal cost, which they often are), the finiteness of resource stocks, and that for some countries natural resources account for the lion’s share of economic activity. National policies may generate not only current distortions but will also affect the market in the longer run – for example, by determining incentives to develop and extract resources. Inappropriate policies may result in the inefficient allocation of exploration and production rights, excessive risks, and sub-optimal levels of exploration and development. Collier and Venables (2010) also note that imperfect competition, which generally implies a constant markup over marginal costs, is unlikely to create market distortions in the case of timing of exploitation of a natural resource, whose optimal path of exploitation generally involves a markup over marginal extraction costs.

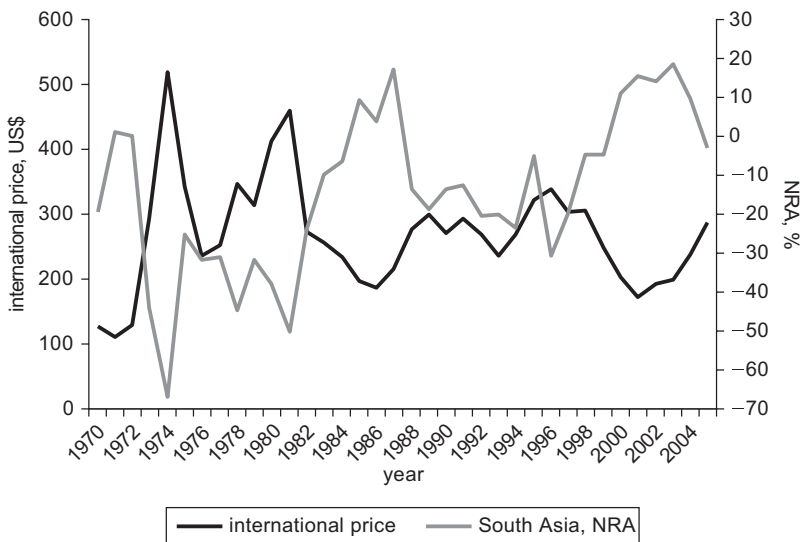
2 Measures affecting the volatility of prices

For a number of staple food commodities, many governments intervene in an attempt to reduce the volatility of domestic prices relative to world prices. In poor countries, this reflects the sensitivity of consumers and governments to volatile prices for important staple goods. Such measures can be shown to be a logical measure for individual poor countries concerned about the adverse impacts of high prices of staple foods on poor consumers (Gouel and Jean, 2011). Historically, such policies have also been extensively used in high-income countries as well in an attempt to stabilise domestic prices. In Europe, the variable

import levies used by the EU were explicitly designed to stabilise domestic prices in the face of variations in domestic prices.

These policies are heavily used for key staples such as rice and wheat and result in a strong negative correlation for these commodities between real world prices and the nominal rate of assistance, as shown in Figure 4 for South Asia. While this can certainly help countries reduce the volatility of their domestic prices relative to world prices, there remains a serious collective-action problem. When many countries use this approach to stabilise their domestic prices relative to world prices, world prices become much more volatile. Price insulation cannot reduce the volatility of domestic prices, but only redistribute it between countries (see Martin and Anderson, 2012). It is possible that such a set of interventions would lower the impacts of high prices on poverty by lowering prices in the countries where high prices have the greatest adverse impact on poverty. However, there is no guarantee that this would be the case. When, for instance, the EU used variable import levies to stabilise its domestic prices, this resulted in instability being exported to the rest of the world by some of the richest countries in the world. In the presence of this collective-action problem, only a policy that takes into account these interactions can reduce volatility without creating the beggar-thy-neighbor problem inherent in this type of policy response.

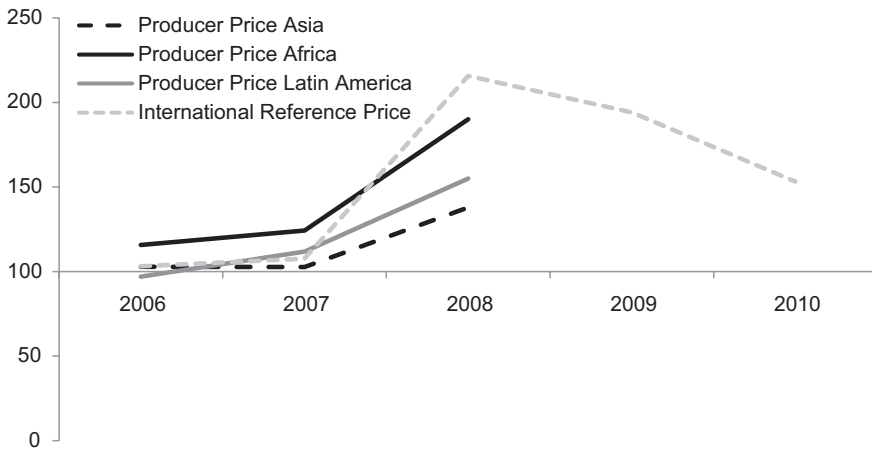
Figure 4. The relationship between world prices and protection rates, rice in South Asia, %



Source: Anderson and Martin (2009).

When Martin and Anderson (2012) investigated the implications of countries' responses to the price surges for wheat and rice in 2008, they found that almost half the increase in the world price of rice could be explained by countries' attempts to insulate themselves from the primary shocks, causing the world price of rice to rise. While some low- and middle-income countries were relatively successful in insulating themselves against the increases in world prices, domestic prices in low-income countries in Africa rose almost as much as world prices, suggesting that price volatility in many African countries may have been greater, given insulating policies, than it would have been otherwise (see Figure 5).

Figure 5. Domestic and international price changes for rice, 2006–10, %



Source: Martin and Anderson (2012).

3 Rule-making implications and priorities

Many, if not most, of the policies that restrict agricultural imports are already the subject of WTO rules or are on the Doha negotiating table. Since its inception as the GATT in 1947, the multilateral trading system has focused on import barriers, with the twin objectives of reducing these barriers and making them less variable. If countries can be persuaded to lower their import barriers on a reciprocal basis, then it may be possible to make all of them better off. The GATT/WTO approach tries to lower protection and to make it less volatile by introducing comprehensive limits (bindings) on import barriers. WTO disciplines are much less comprehensive when it comes to policies used to raise the price of exports, and there are no rules regarding what can be done to contest the cross-border effects of actions by firms that influence the level of prices of what they buy or sell internationally.

The GATT/WTO is usually seen as an institution that facilitates the identification and implementation of cooperative solutions to reduce the adverse impacts on other participants in the trading system of unilaterally chosen policies. The key problem with unilateral policies is the costs they impose on trading partners through deterioration in their terms of trade or excessive volatility. Limits on both import protection and export taxation/restrictions can reduce such adverse terms of trade effects, as well as distortions to production incentives that make the world market more susceptible to price shocks.

The asymmetry in disciplines on import policies compared to export policies in the GATT/WTO has often been remarked upon (see, for example, Hoekman and Kostecki, 2009 and references cited there). The incompleteness of the GATT contract on the export side may reflect the fact that a good part of the political support for the GATT/WTO as an institution comes from mercantilist thinking. From a mercantilist perspective, a competing supplier country introducing export barriers becomes a less effective competitor, creating greater opportunities for home firms to export. If other WTO members are also motivated by mercantilist goals, they will be reluctant to introduce export barriers, which have a direct, adverse impact on export success. Perhaps as a result, there are few restrictions on the use of export taxes in the GATT and the disciplines on quantitative export restrictions are not comprehensive.

The recent upsurge in the use of export barriers suggests that the general mercantilist reluctance to restrict trade cannot be taken for granted when world prices of food rise, or when there is a significant increase in global demand for scarce natural resources. In this situation, many governments may place a higher weight on the welfare of consumers and downstream industries than on the welfare of upstream producer interests (farmers, miners, *etc*) when deciding whether to use export restrictions or taxes. The likelihood of more frequent use of export restrictions may rise as emerging markets continue to experience high rates of economic growth, and this generates greater demand for meat and dairy products and for raw materials.

Article XI of the GATT prohibits the use of quantitative restrictions, whether on imports or on exports. However, it allows for quantitative restrictions on trade in agricultural commodities if concurrent measures are also taken to restrict domestic production. Moreover, Article XI:2(a) permits temporary restrictions to prevent critical shortages of food or other goods. This exception appears to have been interpreted relatively broadly in justifying the application or threat of export barriers, in cases such as the US proposal for an export ban on soybeans in 1973.²⁰ Article 12 of the Agreement on Agriculture (WTO, 1995, p. 51) requires that developed country members and net-exporting developing country members introducing export restrictions under this provision take into account the implications for importing members' food security, and notify the

²⁰ In the recent WTO dispute concerning export restrictions on basic materials brought against China, the panel rejected the argument that the measures could be justified under this provision.

Committee on Agriculture, preferably in advance. However, it appears that this has rarely been done – the most recent notification is reportedly from Hungary in 1997 (Gamberoni and Newfarmer, 2008).

Not all WTO members have been happy with the absence of effective disciplines on export barriers. Countries depending heavily on the world market for food worry they might be vulnerable to export controls or taxes imposed by their suppliers. Not surprisingly, such countries have pushed for disciplines on export controls and taxes (Congo, 2001; Japan, 2000, Jordan, 2001; Korea, 2001; Switzerland, 2000). Some of these proposals were far reaching – for example, the Jordan proposal was to ban export restrictions and bind all export taxes at zero. The proposal by Japan involved disciplines similar to those on the import side, with export restrictions to be replaced by taxes and export taxes to be bound. Recognising that importers' concerns about the reliability of supply might inhibit liberalisation, some exporting countries have also advocated multilateral restrictions on the right to use export restrictions. In the preliminary negotiations on agriculture held between 1999 and 2001 under Article 20 of the Uruguay Round Agreement on agriculture, the Cairns Group (2000) and the USA (2000) put forward proposals for disciplines on export barriers and/or taxes.

These proposals languished for a long time in the Doha negotiations on agriculture. The Doha Ministerial declaration (WTO, 2001) that provided the framework for the negotiations did not discuss the issue of disciplines on export taxes or restrictions. Similarly, the Framework Agreement (WTO, 2004a) mentioned the issue only in very general terms. However, the draft Modalities of May 2008 (WTO, 2008) included some quite specific disciplines on the use of export prohibitions and restrictions under Article XI.2(a). In particular, existing restrictions would be eliminated by the end of the first year of the implementation period, and members would be required to notify and provide reasons for any new measures within 90 days of their invocation. In April 2008, Japan and Switzerland (2008) proposed incorporating stronger disciplines on the use of export restrictions in the WTO.

Fears of inadequate access to supplies in resource-scarce countries and of inappropriate exploitation in resource-rich regions have significant potential to generate trade conflicts and create negative spillovers for the world as a whole (WTO, 2010). Responses by importers to actions by exporters to restrict supply – whether the government does so directly through a tax or other type of policy, or allows firms based in its jurisdiction to exploit their market power in foreign markets (through an export cartel, for example) – may result in some of the rents being shifted from exporters to importers, but the net result for world welfare is negative. The negotiating agenda here is rather straightforward and revolves around agreeing on a ban on export quotas, and on binding commitments on export taxes and equivalent disciplines on export cartels.

Given that countries that have the ability to set prices have an incentive to do so, affected trading partners will have to be willing to engage in *quid pro quo* negotiations and offer concessions to the countries that currently benefit from being able to impose export restrictions. In principle, this is of course exactly what the WTO is set up to do. The challenge is to design a negotiating agenda out of which Pareto-improving deals can be constructed. Despite the difficulty in concluding the Doha Round – which in part is arguably a result of a negotiating agenda that does not offer enough in the way of potential Pareto-improving deals – the history of negotiations under the GATT indicates that this is a challenge that can be met.

As noted by WTO (2010), efforts to agree to rules and commitments on the use of export taxes (and export cartels) affecting natural resource products should extend to seeking agreement on what is permissible and desirable from the perspective of reducing greenhouse gas emissions and sustainable development. Governments are employing a wide array of instruments that aim at ‘green’ production, including direct subsidies (*eg*, for alternative fuels) and tax concessions of different kinds, as well as indirect taxes on consumption (*eg*, on gasoline).²¹ Such domestic policies can also substitute for, and have the same effects, as trade measures so that agreement on the use of such policies are also beneficial from the perspective of reducing the potential for disputes. Recent WTO disputes brought against China and Canada are illustrative. While the panel in the case on Chinese export restrictions ruled that export taxes and other restrictions for basic industrial materials such bauxite, coke and zinc could not be justified on grounds of safeguarding the environment (because they were not applied to domestic producers, which could have been achieved by a general restriction on production/extraction) and were not essential products for which there is a critical shortage (which may justify quantitative restrictions under GATT Article XI), clarifying what is and what is not allowed to achieve national environmental objectives is clearly important.²²

Imperfect competition, market power and high levels of concentration characterise some commodities markets and may result in price distortions. At the national level, competition policy and/or regulation is the appropriate instrument to address uncompetitive behaviour that may result in distorted pricing. From a

21 Policies to stimulate the use of biofuels are a good example. Domestic subsidies, tax credits or mandates for the use of particular types of biofuels are generally consistent with GATT rules. Protection measures designed to encourage the use of domestically produced biofuels are subject to WTO rules on binding of tariffs and other duties and charges, and would normally be expected to be subject to reductions in protection under the Doha Agenda negotiations through lowering agricultural (ethanol) or non-agricultural (biodiesel) tariffs. One surprising feature of the Doha negotiations is that the protection of ethanol – which diverts the sourcing of ethanol from lowest-cost international sourcing to reliance on domestically produced maize – was not subject to significant proposed tariff reductions because almost all of this protection is provided by a measure classified as an Other Duty and Charge.

22 China was subject to stricter rules on export restrictions than apply to other WTO members as it made specific commitments not to use such policies in its accession protocol, which the panel argued invalidated China’s ability to invoke the general exceptions clause of the WTO (Article XX). The case illustrates that even if rules are agreed, it will also be necessary to define when what may be regarded as ‘substitute’ policy instruments are in fact permissible.

global rule-making perspective, the question is what international cooperation can do to address the cross-border negative spillovers that are created by the behaviour of firms located in a foreign country (or, in the case of multinationals, that are subject to multiple jurisdictions). As discussed above, 'competition issues' may arise in the operation of both food and non-food commodity markets, but are more likely in the case of natural resources because production and/or exports of such resources often involves a relatively small number of large firms (many of which may also have strong links to the state). Some markets – most notably for oil – are effectively cartelised. Market power and oligopoly have a number of implications, including possible foreclosure of markets for more efficient foreign producers. Also important in terms of welfare impacts is likely to be political uncertainty and risk that precludes efficient investment and generates inefficient forms of trade (Collier and Venables, 2010; WTO, 2010).

Competition policy was one of the three Singapore issues suggested for negotiation at the 1996 WTO Ministerial Meeting that eventually were taken off the table at the 2003 Cancun Ministerial. Hoekman and Saggi (2006) argue that one reason was that the focus of discussions and potential negotiations were not clearly on negative spillovers or market access constraints associated with a set of policies. Instead, most of the deliberations revolved around competition policy per se and the benefits of adopting such policies – something that can, and has, been implemented by countries autonomously. Most proposals stressed national enforcement-related disciplines, including as a mechanism through which to deal with the effects of international cartels (including export cartels). International cooperation to address negative spillovers caused by national competition policy enforcement was to be on a voluntary basis.

Arguably, any effort to negotiate rules of a competition policy nature must address situations that involve private sector behaviour that gives rise to cross-border negative externalities. Antitrust exemptions for export cartels are an obvious example (Hoekman and Saggi, 2007), as are international cartels. The latter are already subject to national antitrust law. A number of major cases in recent years against global cartels connected with the food industry have illustrated the importance of active enforcement and international cooperation between competition authorities.²³ As regards export cartels, a distinction should be made between cartels that involve states and cartels of private firms. The former may be an efficient mechanism if the product concerned is a non-renewable natural resource (Collier and Venables, 2010). In any event, it is unlikely that it will be feasible to negotiate any efforts to declare such arrangements illegal given that, for many of the producing countries, the natural resources represent a major source of national wealth.

In many of the areas that are sometimes mentioned as potentially giving rise to competition concerns, there is significant uncertainty/ambiguity over whether a practice, level of market concentration, prevailing market structure, *etc* should

²³ See e.g., Connor (2000), Bolotova *et al* (2005, 2008) and Connor and Helmers (2006).

be of concern (*ie* it affects price levels or generates excessive volatility). The discussion over the effects of monopsony power of large retailers and supermarkets is an example. This suggests a first priority is to compile much better data and to undertake a concerted effort to identify negative cross-border spillovers and analyse whether these should be accepted (as in the case of cooperation between countries relating to non-renewable natural resources such as oil). Thus, greater transparency and analysis should be part of any forward-looking programme of work in the WTO.

What matters most? Import protection? Export restrictions? Private restrictive business practices? The agenda on import protection is well understood and is already squarely on the agenda of the WTO and on the table in Doha. Making progress in further disciplining the scope to use import barriers is important – the estimated welfare gains from lowering applied levels of protection and bringing down tariff bindings are significant. But extending the effort to agree on disciplines on export restrictions is equally important, not least because the current greater ability of countries to use export restrictions is likely to have a direct bearing on the willingness of many importing countries to accept greater disciplines on their freedom to use import policies to support an increase in domestic production. An immediate priority is to agree on a code of conduct to exempt food aid from export restrictions.

Of particular importance in moving forward to negotiate disciplines on export restrictions is applying the approach to rule-making that is already embedded in the WTO – to prefer instruments that are based on the price system over those that constrain quantities. Disciplines in the WTO today have greater bite on quantitative restrictions on exports than on the use of export taxes. From an efficiency and transparency perspective, this is a positive feature of the status quo. It suggests an approach that involves a process of negotiating commitments (bindings) on export taxes while strengthening the disciplines on the use of quantitative limitations. The data that were summarised previously on the trends in agricultural policies reveal that the level of export taxation in many developing countries today is far less than it was several decades ago. This suggests that an important service the WTO can provide to these countries is to act as a mechanism to lock in the current situation. While much media attention has been devoted to the use of export measures for rare earths and other industrial material inputs, it is important to recognise that the use of export taxation was much more prevalent in the past – suggesting that there is also scope for a reversal of this trend.

Recent developments illustrate that developing countries are making greater use of export restrictions (Datt *et al*, 2011). The Global Trade Alert initiative has documented an increasing number of cases of these countries putting in place new restrictions (Evenett, 2011). The increasing use of such restrictions by more advanced developing countries is worrisome (Gillson and Datt, 2011). Winters (2011) argues that efforts to negotiate disciplines on export restrictions need to

recognise that governments are unlikely to accept binding restrictions on export taxes if this precludes them from taking action in 'emergency' situations. He therefore suggests that negotiations to cap export taxes be complemented with a safeguard-type analogue that imposes a process and procedures under which taxes can be raised above caps for a limited period of time. Criteria would need to be agreed on what types of events could trigger the safeguards, procedures agreed on verifying whether the criteria are satisfied, and mechanisms put in place that would help governments to manage the political economy. As is the case for import safeguard procedures or antidumping, agreement on criteria for invoking the mechanism would not only enhance transparency but remove the threat of tit-for-tat retaliation.

At the end of the day, the WTO is an incomplete contract and will remain one. In practice, there will always be ways in which a government can change the relative magnitude of support or taxation for some industries. This suggests that the focus should be on the policies that are most detrimental (*ie* impose the largest negative spillovers on trading partners). Economic first principles suggest that these will be quantitative restrictions, not tax- or price-based measures. But export taxes and restrictions are more pernicious than import tariffs because of the associated negative spillovers for the trading system in terms of greater volatility, and the systemic costs of creating incentives for affected countries to 'self-insure' by taking actions to increase their self-sufficiency.

4 Concluding remarks

The current crisis illustrates how the world can end up with a set of policies that generate large distortions on global commodity markets. Under normal agricultural conditions, there are already major distortions in terms of costly taxpayer support to reduce imports and encourage production and exports. Under abnormal global market conditions, such as those in 2007–8 and 2010–11, exporters restrict exports while importers stimulate them through cuts in border protection. To a large degree, these attempts at insulating domestic prices from world price shocks are offset by the increases in world prices they create.

What is needed is a system where both imports and exports remain free to flow in good times and bad. This is especially important if trade is to remain a reliable avenue for food security. If, in bad times, importing countries are subject to the export-restricting actions of producing countries, they will consider trade an unreliable way of maintaining food security and will reconsider how to manage their agriculture; there will be a greater temptation to move toward more self-reliance as insurance against the bad times. And if, in good times, exporting countries cannot have access to markets because of import barriers and other subsidies, they will be reluctant to give up the right to restrict exports during bad times.

Unfortunately, the ongoing Doha Round of trade negotiations as currently configured will not fully address these problems. The Round has focused primarily on traditional forms of agricultural protection – trade barriers in the importing countries and subsidies to food production in high-income producing countries. While lowering bound tariffs will help reduce the destabilising effects of insulating trade barriers, proposals to expand the use of safeguard measures could increase the variability of world prices. Proposals put forward in the Doha negotiations do contain some potentially valuable disciplines on the use of export restrictions that might help diminish their destabilising impacts. Measures to reduce barriers to trade in environmental goods such as ethanol could also be important, although the fact that ethanol tariffs were effectively excluded from the negotiations on agricultural and non-agricultural tariffs means that protection on this product would need to be explicitly included if progress is to be made in reducing this distortion.

Even in the event of a successful Doha Agenda negotiation, much more will remain to be done to discipline the use of policies that may both affect the level of prices and augment instability. Further attention will need to be given to the enhancement of WTO disciplines on export restrictions. Export restrictions tend to (i) distort prices and the allocation of resources, therefore impeding investment and the supply-side response; (ii) prevent local farmers from receiving the higher world market price for their production; (iii) displace local production to crops that are not subject to export restrictions, therefore aggravating food security and price concerns; and (iv) exacerbate the rise and fluctuations of global food prices, therefore creating a vicious incentive for trading partners to follow suit, curb exports, and hoard. As, if not more, important, by signaling that global markets cannot be relied upon to function, export controls create incentives for importing countries to subsidise domestic production, resist binding commitments on the level of import protection/domestic support, and more generally emulate the types of policies that have been pursued in many high-income OECD countries for agriculture.

Export restrictions can help stabilise domestic prices in the exporting country, but may do so at significant cost in terms of greater world price volatility and higher average prices for net importers. As trade liberalisation generally takes a long period of time to be negotiated and implemented, there is, in principle, ample opportunity for governments to develop or strengthen safety-net programmes and complementary policies to maintain real incomes of the poor. Such time does not exist in instances where there are acute shortages that are exacerbated by beggar-thy-neighbor export restrictions. But in such situations, international trade policy rules, with their emphasis on imposing maximum barriers on tariffs, are irrelevant for net importing countries. Governments will likely want to lower tariffs, not raise them.

The food price increases that occurred in 2007–08 – and the response by food exporters – revealed that an exclusive focus on liberalisation on the import side

and reducing domestic support is too narrow. Export restrictions and export taxes need to be on the WTO negotiating agenda. Current disciplines are weak – Article XI of GATT is permissive for agriculture export restraints, and export taxes are unconstrained. We have argued that there is a good case to focus attention first on strengthening the ban on the use of quantitative restrictions in Article XI by making this unconditional, and on disciplining the scope to use export taxes through negotiating specific bindings, analogous to what has been done for import tariffs. As outlined in some policy proposals to the WTO, such disciplines might incorporate negotiable restrictions on export barriers related to increases in world prices – a type of discipline on price insulation that has not featured in WTO measures for export restrictions in the past.

Effective disciplines on export restrictions require that rules extend to export cartels that are sanctioned by home country jurisdictions. Active antitrust enforcement is important to combat international cartels. While these have been less prevalent and less detrimental in food-related sectors when measured by the magnitude of overcharges than cartels in other sectors (Bolotova *et al*, 2005), the number of cartels that have been prosecuted clearly show that incentives to collude exist. Combating international cartels is largely an agenda for the major countries that have the institutional capacity to investigate and take action against the firms concerned. Much of the potential competition policy agenda is arguably at the country level. High prices of transport, logistics and other services are major sources of de facto taxation of farmers in developing countries, quite independent of any explicit taxes or implicit taxation resulting from a relative bias of policy against agriculture.

The importance of greater competition along the supply chain in low-income countries has already been stressed. A lack of competition and the exploitation of market power in relevant domestic markets – by buyers, processors, transporters, *etc* – may result in excessively high prices of inputs such as seeds, fertilizer and logistics services that lower the return to farming. Research has shown that the degree of competition on both upstream (input) and downstream market segments affects the incentives confronting farmers to invest and improve productivity. This, in turn, can have implications for world markets by reducing global supply and thus putting upward pressure on prices. However, the economic literature has also shown that one cannot generalise – specific circumstances matter, firms with a dominant position may provide valuable services that would otherwise not be available as a result of institutional weaknesses and market failures, and so forth. Thus, one implication for multilateral cooperation looking forward is to invest more in monitoring and analysing the operation of commodity markets at the national level, at the level of global value chains, and internationally.

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Having fluctuated in a relatively narrow band for almost 20 years, according to the UN Food and Agricultural Organisation (FAO) real food prices spiked in 2008 and in 2010-11. Moreover, in its latest report on food insecurity, the FAO estimated that just under 240 million persons were undernourished in Africa in 2008; the comparable number for Asia was even higher – in excess of 560 million persons. In addition, small farmers have been found to be particularly vulnerable to volatile food prices. The contributors to this volume identify and assess the importance of the factors responsible for the recent increases in the levels and volatility of commodity prices. While many have stressed the consequences of export restrictions on such prices, the approach taken here is broader and includes four chapters on the impact of the impact of financial speculation and anti-competitive practices in commodity markets.

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