

John Murray: Commodity prices - the long and the short of it

Remarks by Mr John Murray, Deputy Governor of the Bank of Canada, at the Institute of Public Administration of Canada (IPAC) - Saskatchewan/Johnson/Shoyama Graduate School of Public Policy, Regina, Saskatchewan, 10 February 2011.

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Commodity prices are once again making headlines. Some commodity prices, such as those for copper and cattle, have reached record highs; others are rising quickly and approaching previous peaks. Consumer prices world-wide are under mounting upward pressure, and escalating food costs have triggered riots in some developing countries. The price of OPEC crude oil, which had spiked at an all-time high of US\$145 in the summer of 2008, only to collapse to US\$34 within six months, is now hovering around US\$96, leading to increased talk of a new super-cycle in crude.

Not surprisingly, governments are under growing pressure both to contain the rising prices of these primary products and to dampen their volatile movements. Leaders of the G20 countries, meeting in Seoul, Korea, late last year, promised – “further work on the regulation and supervision of commodity derivatives markets,” and said that they would strengthen efforts to “mitigate excessive fossil fuel price volatility.” Nicolas Sarkozy has specifically identified commodity price volatility as a priority issue for France’s presidency of the G20 this year, while regulators in the United States have proposed new curbs on speculative trading in several commodities.

The behaviour of commodity prices and the actions that might be taken in response to their suspected misbehaviour are of special interest to Canada. We are not only a major producer and exporter of many primary products, we are also a significant consumer of them, especially of energy.

My speech today describes the distinguishing features of commodity price movements over different time horizons, running from the very long run to the very short run. It then explores the various factors – both fundamental and speculative – that might account for their unusual behaviour. It concludes with some comments on various policy responses that have been proposed to manage these movements and to improve the performance of commodity markets more generally.

Why commodity prices are of special interest to Canadians

Canada is unusual among advanced economies. It is the only G7 country that is a major commodity exporter. The production of primary products accounts for roughly 11 per cent of our gross domestic product. While this is much smaller than it was 50 years ago, it is nearly three times the relative size of commodity production in the United States and far higher than that of most other industrialized countries (see Appendix, Chart 1). In addition, commodities account for roughly one third of our exports.

Within Canada, Saskatchewan is like a microcosm of the national economy, but with commodities playing an even more important role. All ten provinces and three territories have significant resource sectors, but among the provinces, Saskatchewan, Alberta and Newfoundland/Labrador stand out (Chart 2).

The resource sector is a major source of income and investment, and movements in world commodity prices have an outsized effect on Canada’s terms of trade and national wealth. The relative importance of different commodities has shifted over time, with energy now representing a much larger share of total commodity production and food accounting for a much smaller, but still important, share (Chart 3).

Commodity prices in the very long run

I will have a great deal to say about the exceptional short-run volatility of commodity prices in a few minutes, but for now I would like to focus on the very long run. Commodity prices over long stretches of time, say 50 or 100 years, are actually quite stable.¹ Yet if you follow the news you would think new price records are being reached every few days. How can one explain this apparent inconsistency? One of the answers lies in the important distinction between what economists call real and nominal prices. Nominal prices are the ones you and I see reported every day. For example, the current price of oil, as I noted earlier, is approximately US\$96.² However, this can give a misleading impression of how high or low commodity prices really are. Since inflation generally pushes all prices higher over time, it is important to adjust commodity prices for these changes in the purchasing power of money in order to get a better sense of their true relative cost. Chart 4 plots a broad-based index of commodity prices over the period 1970 to the present in both real and nominal terms. The commodities that comprise the index are weighted according to their relative importance in Canadian production. As you can see, the real price line is much flatter than the nominal price line and shows more stability through time. The results are essentially unchanged if we begin the analysis as far back as the mid-1800s or 1900.

Charts 5 and 6 provide a similar decomposition, but for two subcomponents of the aggregate index that are of particular interest to Saskatchewan – oil prices and food. If you look closely, you will notice that both of the real-price series are relatively stable, unlike the nominal-price series, which have risen sharply over the past 40 years, reflecting the effects of generalized price inflation.

The long-run price stability of most commodities, subject to subtle differences in trend, should not come as a surprise. Given sufficient time, consumers and producers adjust to changing market conditions. Persistent price increases encourage consumers to economize on the use of more expensive commodities and move to alternative goods. At the same time, producers find it profitable to tap new and often more expensive sources of supply, and to develop new technologies to assist them. Investment and innovation also allow producers to bring new products to market, facilitating the process of economization and substitution. All of this takes considerable time, however. While the supply responses might be shorter in some sectors such as agriculture, for major energy projects the gestation period can be as long as 10 or 15 years. Eventually, though, demand and supply adjust – in many cases taking prices back to where they started. This is what economists often refer to as “mean reversion.”

What about the significant price increases we’ve seen since 2002?

Although mean reversion is frequently observed in the very long run, commodity prices can also experience large and persistent swings over 5-, 10- and even 20-year periods. Price increases are usually followed by price declines, and vice versa, but the timing of these reversals is highly uncertain.³

¹ See D. Coletti, “The Long-Run Behaviour of Key Canadian Non-Energy Commodity Prices: 1900–91,” *Bank of Canada Review* (Winter 1992–1993: 47–56).

² For convenience and by convention, world commodity prices are usually quoted in U.S. dollars. This means that whenever the foreign exchange value of the U.S. dollar changes, commodity prices usually change too.

³ Estimates from the International Monetary Fund (P. Cashin, C. J. McDermott and A. Scott, “The Myth of Comoving Commodity Prices,” IMF Working Paper, WP/99/169, 1999) suggest that the average length of a slump in oil prices is about 50 months, while oil-price booms typically last just over 20 weeks. However, there is obviously a great deal of variance around these averages.

The magnitude and timing of commodity price movements are notoriously difficult to predict. Indeed, some have suggested that they are only slightly easier to explain after the fact! Debates about the “true” causes of the dramatic super-cycle that we have observed in commodity prices over the past eight years continue. While there is little doubt that remarkable shifts in global demand and supply have played a major role, the extent to which other forces, driven perhaps by large financial flows, might have served as an accelerant remains an open question.

What is evident, looking at the data, is the significant role played by the emerging-market economies (EMEs). Over the past ten years, they have accounted for the majority of the growth in the global economy (Chart 7). More importantly for our purposes, EMEs have also accounted for most of the surge in global demand for raw materials (Chart 8).⁴ Their accelerating resource needs are being driven by three developments. First is the phenomenal GDP growth that many EMEs have experienced. Second, current production processes in the EMEs are very resource intensive, particularly with regard to their energy requirements. Third, rising disposable incomes and a growing middle class in the EMEs have added an important consumption element to the mix, through increased demand for food and a broader range of energy-using household products. Bringing things a little closer to home, high demand for food in EMEs has contributed importantly to the demand for potash.

Growing demand in both the EMEs and advanced economies, as well as occasional supply bottlenecks, can explain most, though perhaps not all, of the upward movement in commodity prices that we observed from 2000 to mid-2008. The same is true of the sharp correction that followed in late-2008, as well as the recent rebound.⁵ These three episodes mirrored the phenomenal rise, sudden collapse, and equally sharp recovery in global growth over the period. The fact that the latest jump in commodity prices has occurred so soon in the business cycle, while growth in many advanced countries continues to lag, is testament to the growing importance of the EMEs and their considerable influence in commodity markets.

Extreme short-run volatility

Aside from the remarkable long-run stability of commodity prices, and their significant price swings over the business cycle, commodity markets are also notable for their extreme volatility in the short run. While the high-frequency movements of commodity prices are typically several times the size of those in the CPI or the GDP deflator, they occasionally become even larger (Chart 9). The recent spike in commodity price volatility is an obvious example, but it is by no means unprecedented. Similar, if not larger, spikes were witnessed during the Great Depression and the tumultuous 1970s and 1980s.⁶

All of these high volatility episodes can be linked to exceptional macroeconomic circumstances or political unrest, but many analysts believe that destabilizing financial market dynamics have also been a contributing factor. As I noted earlier, there is an ongoing debate about the significance of speculation, however defined, and whether economic fundamentals alone can explain what we have observed.

Those who favour a fundamentals interpretation of events point to the highly inelastic nature of commodity demand and supply in the short run – that is to say, their insensitivity to

⁴ See D. Coletti, R. Lalonde, P. Masson, D. Muir and S. Snudden, “Commodities and Monetary Policy: Implications for Inflation and Price-Level Targeting,” (Bank of Canada, forthcoming).

⁵ See O. Gervais and I. Kolet, “The Outlook for the Global Supply of Oil: Running on Faith?” Discussion Paper No. 2009-09, Bank of Canada, 2009).

⁶ See O. Calvo-Gonzalez, R. Shankar and R. Trezzi, “Are Commodity Prices More Volatile Now? A Long-Run Perspective” (World Bank Policy Working Paper No. 5460, 2010).

unexpected price changes.⁷ Even large price movements seldom elicit a significant drop in demand or increase in supply in the short run, owing to fixed consumer tastes, set production processes, the long lags associated with bringing new commodity supplies to market and the absence of close substitutes. Relatively modest shocks to the macro economy can therefore have an exaggerated effect on commodity prices.

Low interest rates may also occasionally exacerbate upward pressure on prices since commodity users are inclined to hold larger inventories when carrying costs are low. In addition, commodity producers may be inclined to delay production and “leave the oil in the ground” until interest rates rise and the opportunity cost of postponing the sale of their commodities is higher.⁸ As a result, demand increases while supply is squeezed.

Alternative interpretations and the role of the speculator

Few economists would dispute the importance of supply and demand and the special nature of commodity markets in explaining price movements. Some maintain, however, that there is more to the story and argue that zealous investors and the destabilizing dynamics of financial markets frequently cause commodity prices to overshoot their appropriate levels. Before demonizing speculators, however, it is important to define what we mean by “speculators” and remember that most financial market activity is welfare improving. In other words, there are both good and bad forms of speculation.

For the purpose of our discussion, I am going to define a speculator as someone who has no direct commercial interest in holding physical commodities but is willing to take an open position (i.e. make an investment) in the form of a futures contract, derivative or other financial instrument in the expectation of earning a positive return for bearing this risk.

Commodity producers, and those who use commodities to manufacture other products, typically want to hedge their positions. They use these same financial instruments to manage the extreme volatility of commodity prices by locking in future prices, thereby shifting the risk onto those more willing to bear it. Speculators can therefore fulfill an important function. Their actions permit the maintenance of active, liquid markets for hedging and assist the price-discovery process, making the system more efficient and stable. After all, the guiding principle of buying low and selling high should actually help to reduce price volatility.

Those who see speculators as risk creators, rather than risk absorbers, argue that the increased volatility observed in recent years was linked to a surge in outstanding futures contracts, derivatives, exchange-traded funds and other financial products held by individuals with no commercial interest in commodities. Commodity assets under management rose by more than US\$100 billion in the past year alone, a roughly 40 per cent increase (Chart 10). Low interest rates and a search for yield, combined with the introduction of innovative financial products and what some have termed the “financialization” of the commodities market, have produced an unhealthy brew, they argue.

Correlation, however, does not prove causation, and those on the other side of the debate cite a number of curious and seemingly contradictory aspects of the financial destabilization story. They argue that it is too early to race to judgement regarding the supposed “dark side” of the market.

⁷ See D. Gately, “OPEC Incentives for Faster Output Growth,” (*Energy Journal*, 25, no.2 (2004): 75–96. Also N. Krichene, “World Crude Oil and Natural Gas: A Demand and Supply Model,” *Energy Economics* 24, no. 6 (2002): 557–76.

⁸ See J. A. Frankel, and A. K. Rose, “Determinants of Agricultural and Mineral Commodity Prices,” in *Inflation in an Era of Relative Price Shocks*, R. Fry, C. Jones and C. Kent (eds.) (Reserve Bank of Australia, 2009).

First, the ratio of outstanding commercial to non-commercial contracts has remained roughly unchanged, although both have grown significantly in the past four years. So there is no sense of undue pressure coming from the unhedged, non-commercial side of the market. Second, investment in commodities is concentrated in the futures market, and its impact on spot prices is mainly indirect (i.e. through arbitrage).⁹ While futures prices might therefore be expected to rise as investor interest grows, the reverse has been observed – with spot prices staying higher than futures prices. Third, if speculators were pushing prices above their fundamental levels, one would expect to see inventory levels rising, reflecting unwanted output. This has not been the case, however. In most instances inventory levels have been falling as prices have been rising, suggesting excess real demand.¹⁰ Finally, it is interesting to note that the prices of many commodities that are not actively traded on exchanges or included in commodity indexes have risen by as much as those that are. The introduction of new investment instruments and new means of speculating, then, do not appear to have made a significant difference in observed price pressures. This conclusion is reinforced by comparisons across time, which indicate volatility is no higher now than it was before these instruments were developed.

Unfortunately, data limitations and the somewhat arbitrary classification of investors as either commercial or non-commercial preclude a more definitive assessment. Although both the fundamentalist and speculative camps can point to supporting evidence, the extent of destabilizing speculation and its impact on commodity prices remain open questions. It would be surprising, however, if investment flows did not have some influence on prices. How large an influence and whether it is stabilizing or destabilizing probably varies over time, as do the costs it imposes on the economy.

What should policy-makers do?

What, if anything, should policy-makers do about high and volatile commodity prices? The answer depends critically on the diagnosis. Is there a market failure that needs to be corrected? Do the fluctuations last long enough to do serious harm? If these movements are predominantly fundamental in nature, attempts to resist them would be largely futile and counterproductive. Efforts to dampen speculation through limits on the number of allowable contracts or tighter margin requirements would penalize both good and bad speculation, and potentially handicap the operation of markets. Efforts to put ceilings on commodity prices would prevent market clearing and reduce supply. Clearly, if anything of this sort is contemplated, it should be done cautiously. President Sarkozy, who will chair the G20 leaders' summits for the coming year, has put reform of the commodity derivative market near the top of his agenda. However, he has also underscored the need for a more thoroughgoing review before any action is undertaken. Various supervisory and regulatory agencies have also called for greater oversight of commodity exchanges, and recently enacted legislation for financial sector reform in the United States has proposed that new limits be put on speculative trading in a number of commodities. This work, however, is still at a very early stage.

Less-controversial measures have also been proposed, which both fundamentalists and market skeptics can support. The first is a call for greater transparency and information sharing with regard to commodity supply and demand. Lack of timely and comprehensive

⁹ The impact on spot prices of investment in commodities is more direct in the case of commodity index funds that are physically backed by the underlying commodities. These investment products are, however, limited to commodities that can be stored (metals, for example).

¹⁰ Care must be exercised in interpreting these results, however, since the relationship between spot and forward prices, and between prices and inventories, also depends importantly on how price expectations are formed.

data hampers the functioning of both the physical and financial commodities markets. Recent work in the oil market, under the auspices of the Joint Oil Data Initiative (JODI), is serving as a useful template for these efforts. Improved information should help stabilize markets and work to everyone's benefit, except perhaps those who profit from asymmetric information and possible manipulation of the present system. The second set of reforms focuses specifically on transparency in the over-the-counter (OTC) derivatives markets and is part of a much larger initiative launched by the Financial Stability Board to enhance financial market infrastructure. The third set of reforms targets the things that several governments do, either intentionally or unwittingly, to inhibit the smooth operation of commodity markets. Some of these take the form of price ceilings or subsidies to households, which elevate demand for certain commodities and often reduce supply. Others involve subsidies to producers, which may divert needed resources to different uses. A prime example is the support for biofuels, which reduces the amount of arable land available for food production. The fourth and final set of suggested reforms involves a number of initiatives that governments ought to take, as opposed to the various things that they should stop doing. The former include structural reforms to make their economies more flexible and resilient to shocks and, more generally, encouraging rather than resisting necessary adjustments to changing market conditions.

Conclusion

As we have seen, commodity prices are notable for three things: their remarkable stability in the long run; their sizable and persistent swings in the medium run; and their exceptional volatility in the short run. These tendencies pose an enduring challenge for consumers, producers and policy-makers. Over the long run, economists such as Prebisch and Singer¹¹ once worried that commodity producers would suffer ever-declining terms of trade relative to manufacturers. More recently, this view seems to have been overturned, with some economists now worrying about the costs that ever-increasing commodity prices will impose on consumers. Over the medium run, economists are concerned about the negative effects that large and persistent swings in commodity prices can have on the macroeconomy by destabilizing output and spurring inflation. In the short run, highly volatile prices, despite their temporary nature, can impose tremendous costs on some of the most vulnerable members of the global community.

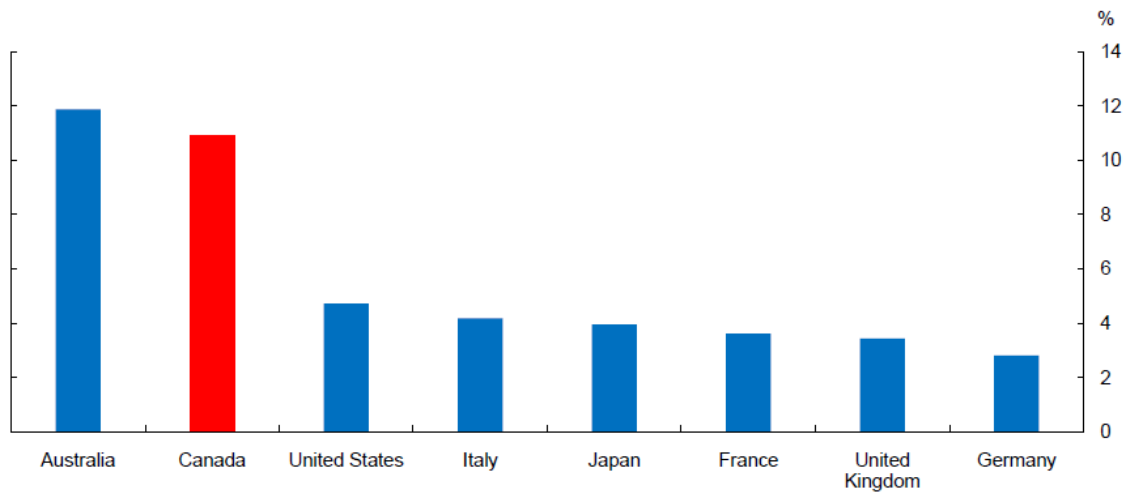
Before racing to solution, however, it is important to understand what forces are driving these prices. Available evidence suggests that most of the major swings, as well as a large proportion of the short-run volatility that we observe, can be explained by market fundamentals. Although speculation and what might be termed "excessive investor interest" might play a role in exaggerating these price movements, the supporting evidence is at best mixed. Policy-makers determined to take corrective action should therefore proceed with caution. Without a clear diagnosis it is difficult to talk about remedies and policy fixes with any confidence.

There are, nevertheless, a number of measures that almost all economists can agree on, no matter where they lie on the fundamentals-to-destabilizing speculation continuum. They include improved transparency and structural reforms that will remove harmful barriers, make markets more efficient and economies more resilient.

Thank you.

¹¹ See R. Prebisch, *The Economic Development of Latin America and Its Principal Problems*. (New York, United Nations, 1950). And H. W. Singer, "The Distribution of Gains between Investing and Borrowing Countries," *The American Economic Review* 40, no. 4 (1950): 473–85.

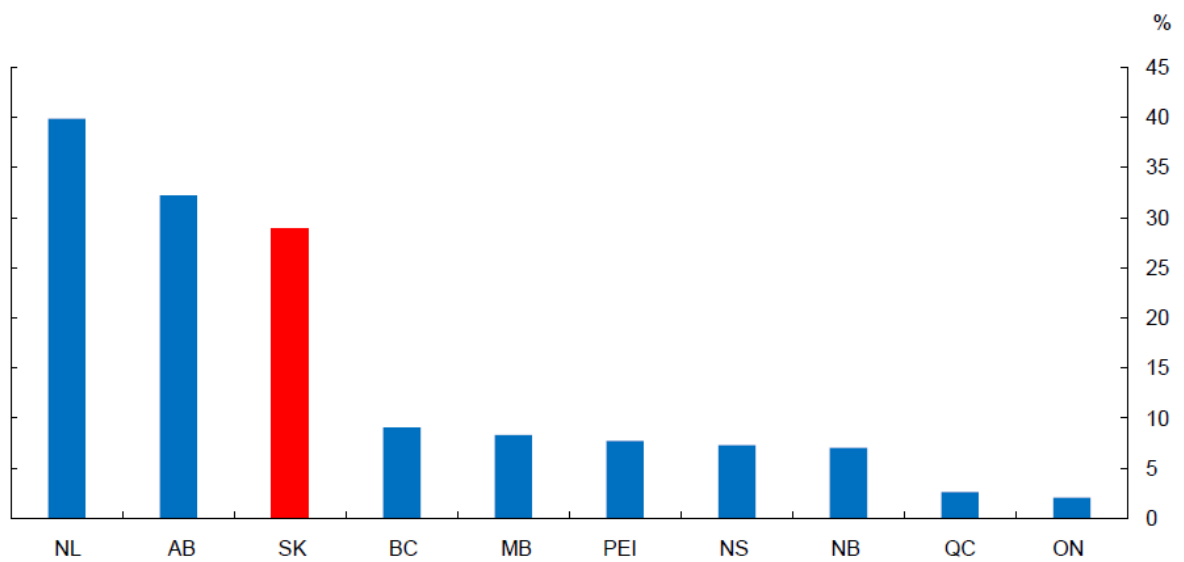
Chart 1
Natural resources as a percentage of GDP



Sources: United Nations Statistics Division, National Accounts Main Aggregates Database

Last observation: 2009

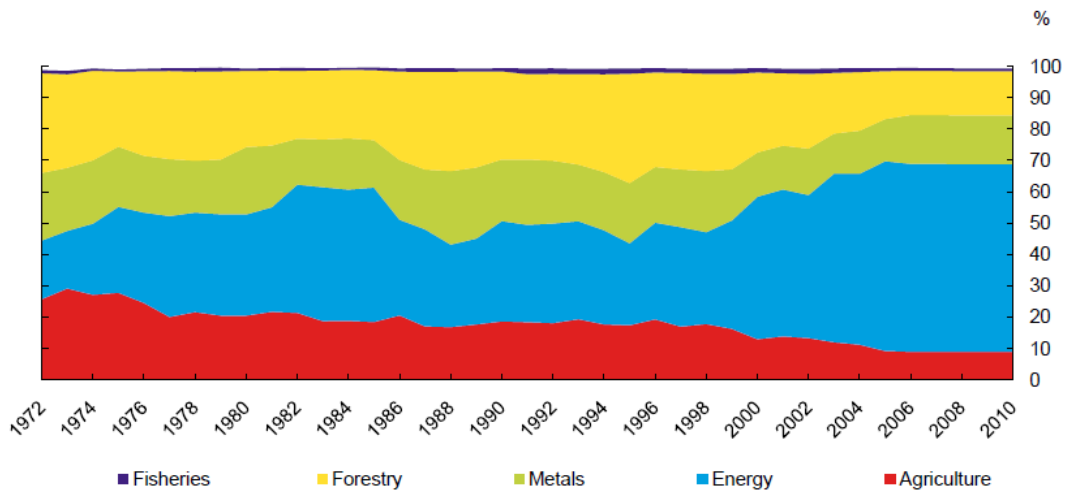
Chart 2
Natural resources as a percentage of provincial GDP



Source: Statistics Canada

Last observation: 2006

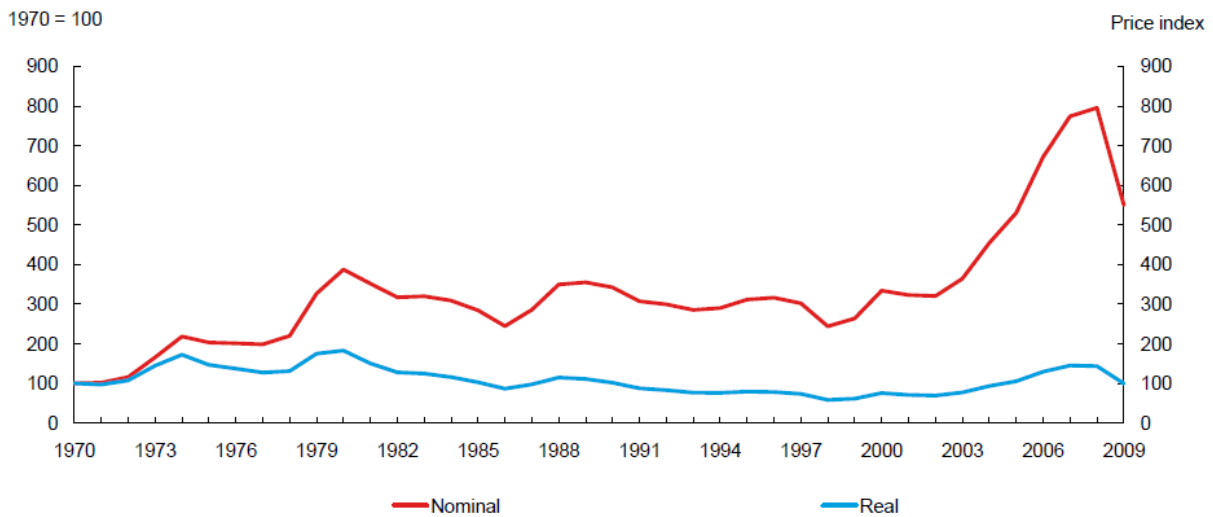
Chart 3
The changing composition of Canadian commodity production



Source: Bank of Canada

Last observation: 2010

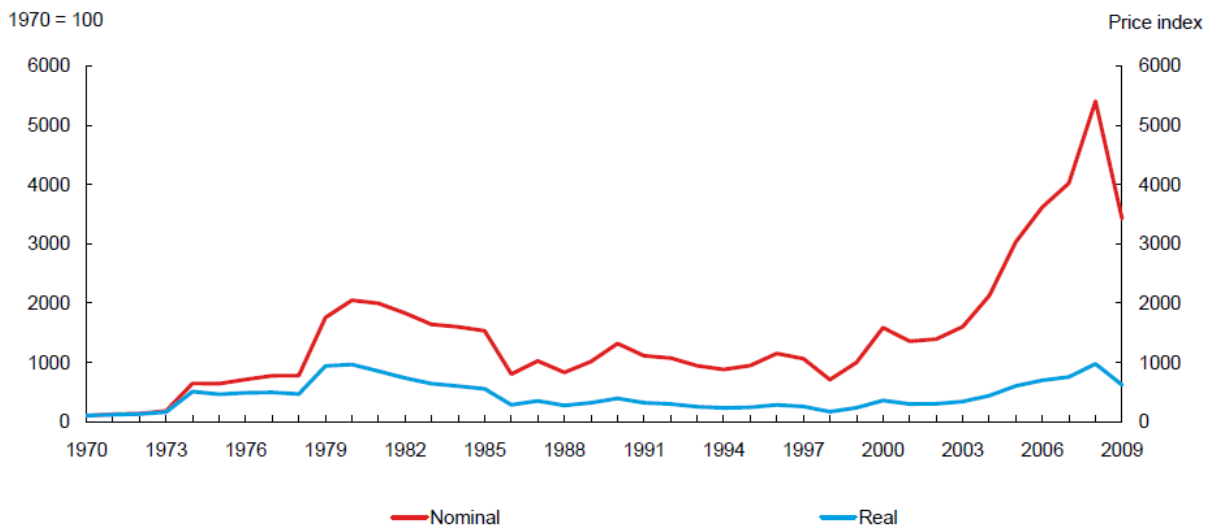
Chart 4
Commodity prices: composite index



Source: Bank of Canada

Last observation: 2009

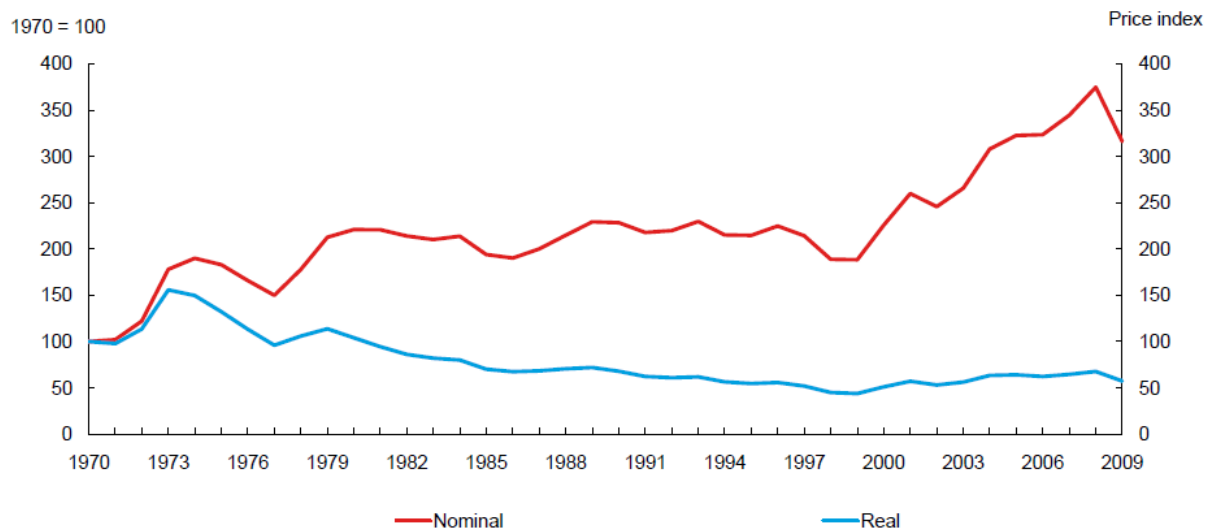
Chart 5
Nominal and real oil-price index



Source: British Petroleum and Bank of Canada calculations

Last observation: 2009

Chart 6
Nominal and real food prices

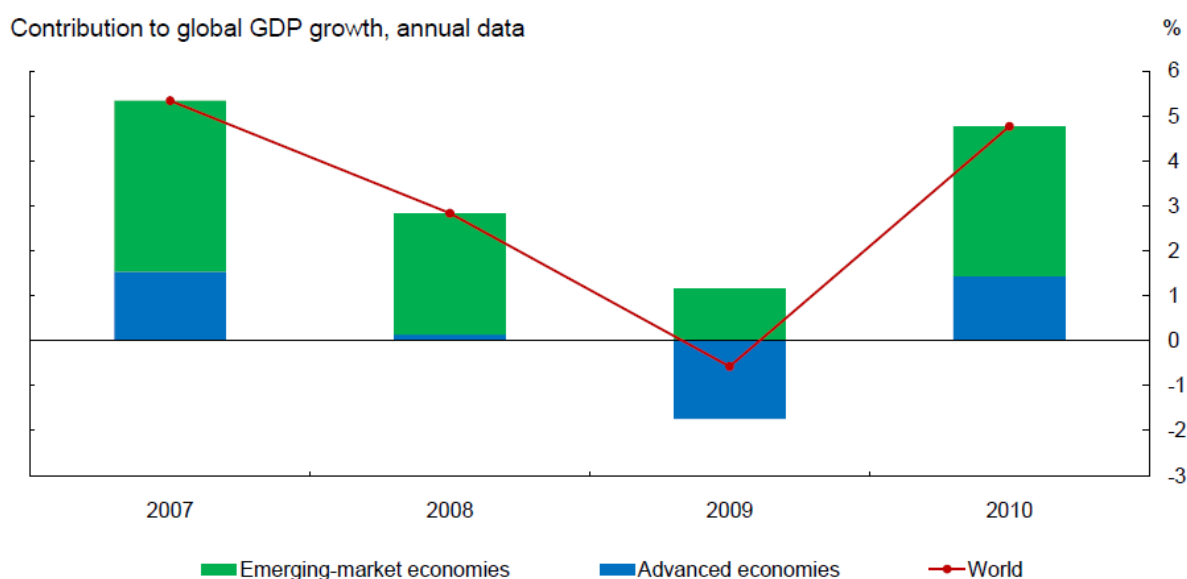


Source: Bank of Canada

Last observation: 2009

Chart 7

Emerging-market economies continue to drive global economic growth

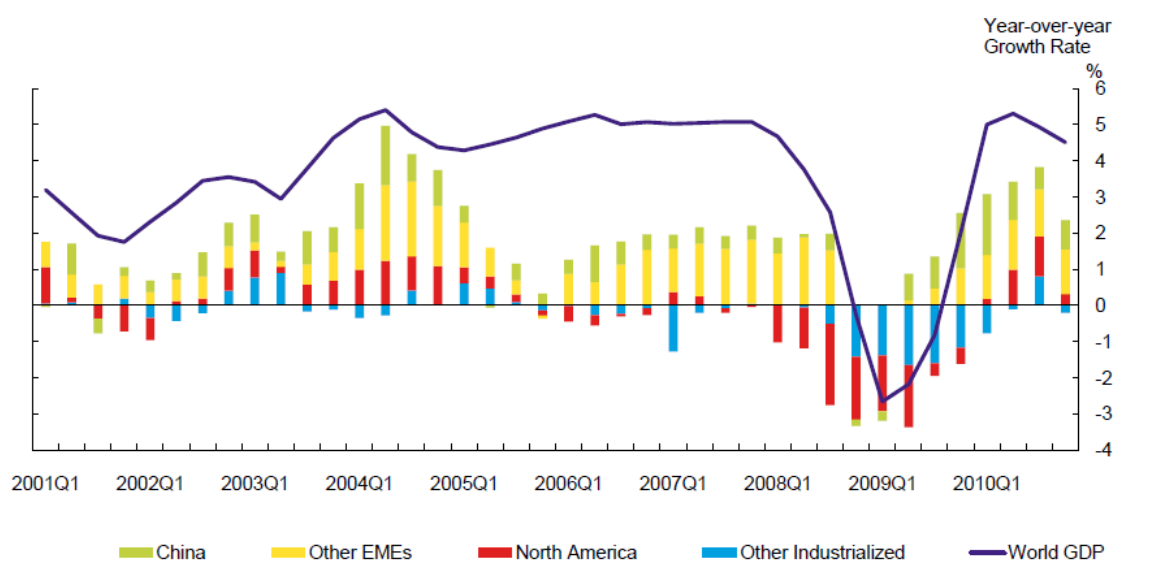


Note: Growth rates for 2010 are International Monetary Fund estimates.
Source: International Monetary Fund

Last observation: 2010

Chart 8

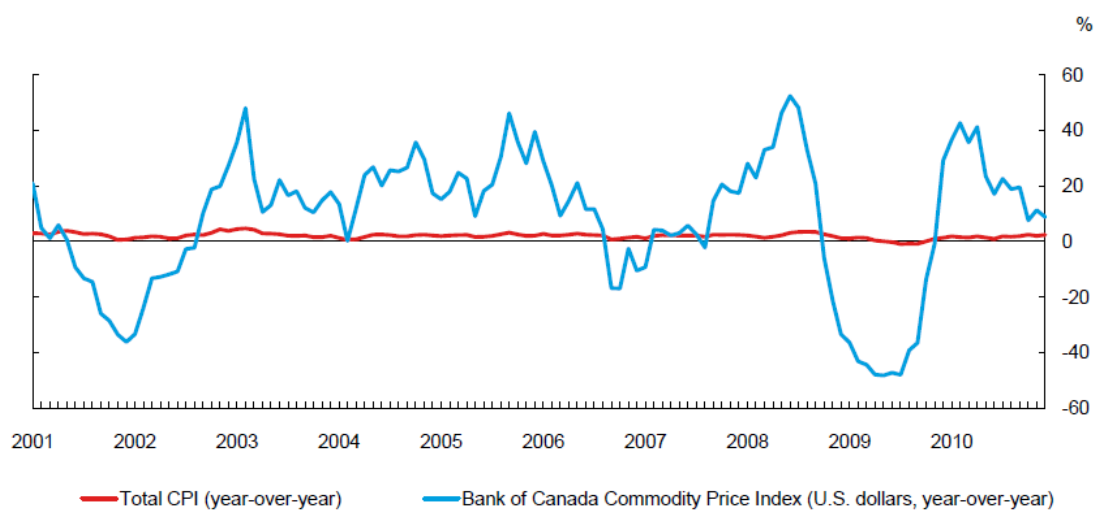
Growth in world GDP and contribution to global growth of oil demand



Source: International Energy Agency

Last observation: 2010Q4

Chart 9
Year-over-year change in commodity prices



Sources : Statistics Canada and Bank of Canada

Last observation: December 2010