

Introduction

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Movements in commodity prices can have large effects on output and inflation. From both an academic and policy perspective, changes in commodity prices relative to the prices of services and manufactured goods pose a number of important questions. First, what are the fundamental processes or shocks that drive these changes and how persistent are they likely to be? Second, through what transmission mechanism do these shocks affect output and inflation and how does economic structure and the policy environment affect the transmission? And third, how should policy-makers respond to movements in relative prices?

The relevance of these issues has increased over the past decade, which has seen a large increase in the level of commodity prices. According to a broad-based measure constructed by the International Monetary Fund, commodity prices more than tripled between 2000 and mid 2008, with the increases widespread (Figure 1). They fell with the global economic downturn but have since rebounded substantially.

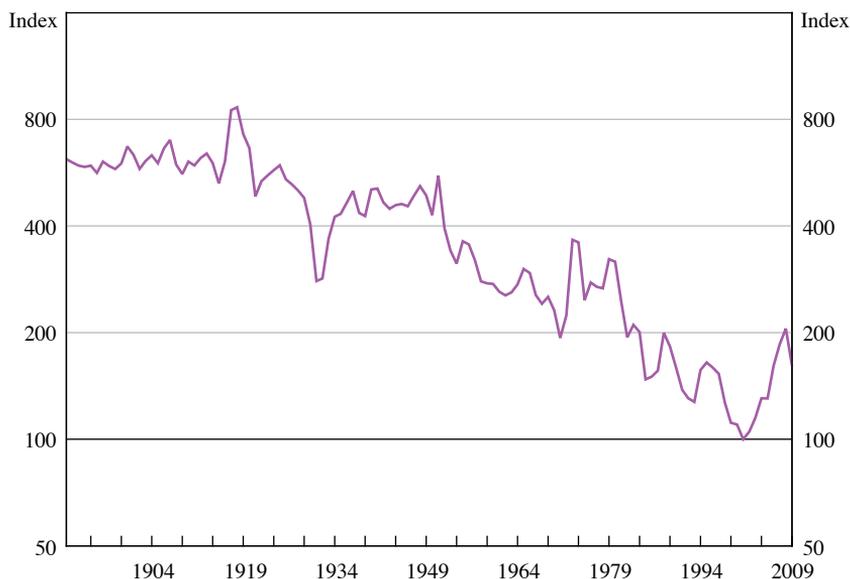
This general experience stands in contrast to the decline in commodity prices relative to the prices of other goods and services over much of the 20th century (Figure 2). Notably, the strength in commodity prices over the past decade has

Figure 1: Nominal Commodity Prices
SDRs, 2001 = 100



Sources: IMF; RBA

Figure 2: Real Commodity Prices
2001 = 100, log scale



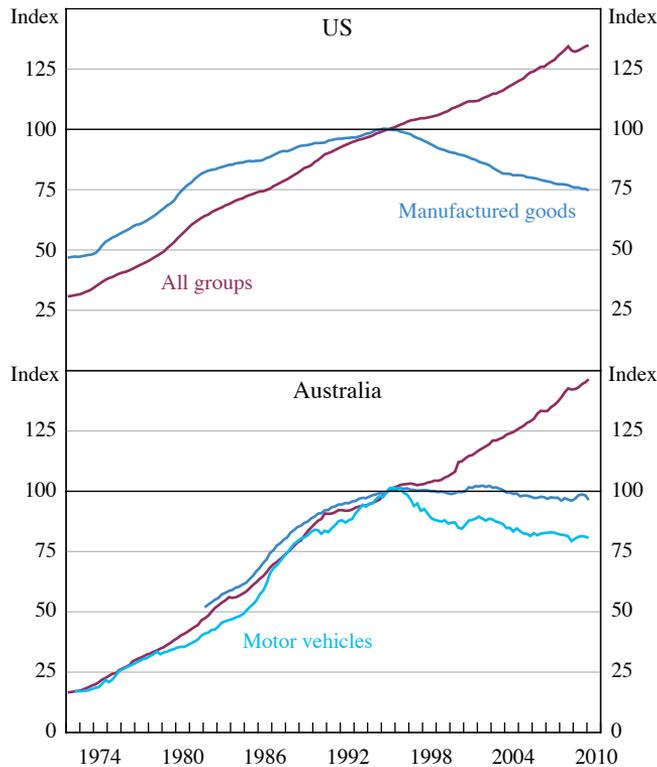
Notes: From 1983, the series is *The Economist's* US\$ 'All items' commodity price index, deflated by the US GDP deflator. Earlier observations have been spliced to this using *The Economist's* US\$ 'Industrial' commodity price index (also deflated by the US GDP deflator) from Cashin and McDermott (2002).

Sources: Cashin and McDermott (2002); Federal Reserve Bank of St. Louis; Thomson Reuters; authors' calculations

coincided with a decline in the nominal price of manufactured goods (Figure 3). This pronounced weakness in manufactured goods prices largely reflects the integration of low-cost developing economies into the global trading system. Of course, the rapid industrialisation of large developing economies has helped to drive up the demand for commodities, thereby linking these trends in commodity and manufactured goods prices.

This Conference – which was jointly organised by the Reserve Bank of Australia and the Centre for Applied Macroeconomic Analysis (CAMA) at the Australian National University – was designed to explore these issues. The Conference was preceded by a workshop in Münster, Germany – hosted by the local university Westfälische Wilhelms-Universität as well as the Canadian-based Viessmann European Research Centre of Wilfrid Laurier University – which provided an opportunity for the authors to present early drafts of their work. What follows is a brief summary of the proceedings of the Conference in Sydney.

Figure 3: Consumer Prices
1995 = 100



Notes: US consumer prices are given by Bureau of Economic Analysis (BEA) consumption deflators; the series for 'all groups' refers to the total personal consumption deflator, and that for 'manufactured goods' refers to the durable goods deflator. For Australian consumer prices, 'all groups' and 'motor vehicles' are as defined by the Australian Bureau of Statistics (ABS), while the series for 'manufactured goods' prices is constructed by the RBA.

Sources: ABS; BEA; RBA

Causes and Nature of Relative Price Shocks

A number of Conference papers and discussions examined the determinants of commodity prices and the causes and nature of shocks to commodity prices.

The Conference opened with a paper by Andrew Rose co-authored with Jeffrey Frankel looking at the macroeconomic and microeconomic determinants of commodity prices. Frankel and Rose discuss a range of possible explanations for the rise in commodity prices, focusing on the period 2003 to 2008. In particular, they explore the role of three factors that may have contributed to the rising demand for commodities. These are: first, the strong (actual and anticipated) economic growth of emerging China and India; second, the possibility of speculative factors fuelled by 'bandwagon expectations' (where forecasts of future commodity prices follow current trends); and third, easy monetary policy. In contrast, on the supply side,

Frankel and Rose suggest that accommodative monetary policy in much of the world may have actually depressed the supply of commodities because lower real interest rates reduce the returns from investing the proceeds of commodity sales.

Their paper finds little support for the hypothesis that easy monetary policy contributed to higher real commodity prices, after account is taken of the effect of economic activity and inflation. Rather, they argue that there is evidence that commodity prices were affected by ‘bandwagon expectations’, consistent with the idea that speculative dynamics accounted for a significant share of the rise in commodity prices. This view was supported by Michael Dooley in his wrap-up discussion, in which he suggested that changes to the regulatory structure of commodity markets had facilitated speculation, driving commodity demand and prices. Further, he argued that greater speculative activity in commodity markets is likely to endure, implying less persistent and more volatile commodity prices. In discussions, parallels were drawn with the move to more flexible exchange rates following the breakdown of the Bretton Woods regime in the mid 1970s.

Frankel and Rose’s conclusion that real economic activity has not had a significant influence on commodity prices was surprising to a number of participants, and stood in contrast to the assumptions and conclusions of other papers presented at the Conference. For example, the paper by Ine Van Robays, co-authored with Christiane Baumeister and Gert Peersman, assumes that oil demand shocks driven by economic activity raise the price of oil. Also, the paper by Lutz Kilian focuses on the potential for easy monetary policy to fuel the demand for commodities.

Kilian reviews the episode of stagflation during the 1970s and presents evidence that the stance of monetary policy led to a significant increase in global liquidity, demand for commodities and inflation. In particular, Kilian suggests that the relaxation of the constraints on monetary policy in the 1970s following the collapse of the Bretton Woods fixed exchange rate regime, and a period of experimentation with different policy regimes, drove this expansion in liquidity. This view contrasts with the more popular notion that the oil price rises of the 1970s were driven largely by supply shocks. Kilian argues that the recent boom in commodity prices was due to an unanticipated increase in global demand.

This point is picked up in the paper by Adam Cagliarini and Warwick McKibbin, who discuss the positive effect that the growth of developing economies has had on commodity prices. Their paper also highlights the other side of the ‘relative-price-shock-coin’, namely the fall in prices of manufactured goods globally. They examine these relative price dynamics using a large structural model of the world economy overlaid with three shocks: a large rise in manufacturing productivity growth relative to that of non-manufactures in developing economies; a fall in the global risk premia; and an easing of the stance of US monetary policy. With plausible calibrations for these three shocks, the model is able to replicate the observed direction of the shifts in relative prices – the decline in the prices of manufactured goods and the rise in commodity prices – but not to the extent seen over recent years. In particular, these three shocks do not explain the full extent of the rise in the relative prices of energy, mining and agricultural goods.

The Transmission of Relative Price Shocks through the Economy

An important issue explored at the Conference was the effect of large relative price shocks on different economies. Of particular interest are how the nature of the shock influences the way it is transmitted, whether or not there are important differences across countries based on differences in economic structure, and how the policy framework influences the transmission.

Van Robays and her co-authors examine the transmission of oil shocks in a sample of eight industrialised economies. Using a structural vector autoregression model they show how three types of shocks – oil demand shocks driven by global economic activity, demand shocks specific to the oil market, and oil supply shocks – have quite different economic effects and imply different monetary policy responses. Oil demand shocks driven by stronger economic activity initially increase real GDP and permanently increase consumer prices, with nominal interest rates generally rising, while positive oil-specific demand shocks generally lead to a transitory decline in real GDP, a mixed response of consumer prices and mostly falling nominal interest rates. For adverse oil supply shocks, economies that are net importers of energy experience a permanent fall in output, a rise in consumer prices and an initial increase in nominal interest rates. For net energy exporters the consequences of an adverse oil supply shock on GDP is mixed, while the effect on inflation is either negligible or negative, which appears to reflect the appreciation of the exchange rate; across these countries, nominal interest rates fall. In addition, Van Robays and her co-authors find that second-round inflationary effects coming from wage increases are important for some economies in Europe – the euro area and Switzerland – but not for other countries, including Japan and the United States.

Cagliarini and McKibbin's results suggest that the overall effect of rapid productivity growth in China on inflation globally has been ambiguous. In contrast, Robert Anderton and his co-authors Alessandro Galesi, Marco Lombardi and Filippo di Mauro find that competitive pressures from large developing economies have helped to exert downward pressure on inflation in the OECD over time – for example, via lower prices for manufactured imports – offset somewhat by higher commodity prices, particularly in oil markets. This issue is also touched on in the paper by Klaus Schmidt-Hebbel and his co-author César Calderón, who focus on the 'non-monetary' determinants of inflation across a large set of countries. They include a potential role for globalisation in explaining a general trend towards lower inflation (via disinflation 'imported' from new low-cost producers such as China) but find little evidence for such an effect.

A theme picked up by several participants was that, over time, policy frameworks have generally been better able to moderate the effect of relative price shocks on overall inflation. Kilian in particular devotes much attention to the anchoring of inflation expectations. Comparing the oil price shocks and stagflation of the 1970s and the oil price shocks of the 2003–2008 era, he attributes the absence of rising inflation over the past decade to be a result of the adoption of monetary policy regimes focusing on price stability. In a similar vein, Schmidt-Hebbel and

Calderón find that across a large sample of countries, inflation-targeting regimes are associated with lower inflation after controlling for macroeconomic and other determinants of inflation. They also find that countries with fixed exchange rates have lower inflation, although this effect is more important for developing countries. Schmidt-Hebbel and Calderón suggest that these findings support the idea that a mechanism that imposes some discipline improves policy credibility and inflation results. Looking at differences over time, Anderton and his co-authors find that inflation expectations have become better anchored and that the effect of the output gap on inflation appears to have declined. Finally, in his wrap-up discussion, John Williams pointed out that inflation expectations have remained well anchored during the recent global downturn, notwithstanding unconventional quantitative easing policies of a number of central banks in major economies intended to stabilise financial markets and stimulate economic growth.

The Response of Policy

The Conference also considered how policies – both monetary and fiscal – respond to shocks that affect relative prices. Issues of measuring inflation and inflation expectations, as well as communication of central bank decisions to the public in the context of relative price shocks, were also considered.

Three papers have some focus on fiscal policy. First, Graciela Kaminsky sets out the arguments in favour of running fiscal policies such that savings are accumulated during terms of trade booms to deal more effectively with times when the terms of trade are weak. She then examines the relationship between fiscal policy and terms of trade cycles in a panel dataset of 74 developed and developing economies. She shows that the stance of fiscal policy differs according to the level of development across economies and the phase of the terms of trade cycle. Fiscal policy in the high-income (OECD) countries is countercyclical relative to GDP, but acyclical relative to the terms of trade. For upper-middle income countries that produce commodities, fiscal policy is typically countercyclical in the presence of terms of trade shocks, but less so during booms in the terms of trade. Second, the paper by Schmidt-Hebbel and Calderón found that fiscal restraint tends to reduce inflation for both developed and developing economies, particularly in the short run. Third, Cagliarini and McKibbin also discuss how fiscal authorities might respond to a commodity boom. They suggest that there may be cases where it is appropriate for countries to set up sovereign wealth funds to invest windfall tax revenues in economies that are not benefiting from the same commodity boom. This would help to reduce the amplitude of the business cycle and diversify risk.

The paper by Cagliarini and McKibbin also provides some insight into how monetary policy might respond to relative price shocks. They recognise that monetary policy, which is typically concerned with the overall rate of inflation, is also able to affect relative prices in the short run because a temporary change in real interest rates has differential effects across sectors. This implies that there might be a role for monetary policy to respond directly to relative price shocks to facilitate a more rapid adjustment to a new (and persistent) relative price equilibrium. They note,

however, that the optimal response to persistent relative price shocks may be to keep policy unchanged so long as inflation expectations remain well anchored.

As a number of participants noted, in considering the response of policy it is important to have an accurate understanding of inflationary pressures abstracting from the near-term volatility associated with relative price shocks. To this end, Shaun Vahey in his paper co-authored with Francesco Ravazzolo constructs a measure of underlying inflation based on an overall probability distribution of inflation outcomes, by combining forecasts of inflation for different groups of goods and services. Vahey's paper provoked some debate about the usefulness of this type of underlying measure of inflation. Some participants saw such a measure as a useful tool for internal discussion among policy-makers, while others thought it could be a device for the public communication of policy, in part because it downweights some components of the basket of goods and services, but does not exclude them like some other measures of underlying inflation. The paper by Pierre Siklos also touches on this issue by looking at forecasts of inflation and the role that relative price changes have had in generating variation across different forecasters. He finds that relative price changes, particularly in commodity and asset prices, can move inflation forecasts relative to a benchmark forecast; this phenomenon has been particularly true over the past decade.

Conclusions

The large increase in commodity prices since the turn of the century and the steady decline in the prices of many manufactured goods have raised questions as to the causes and consequences of relative price movements, as well as how policy-makers might respond to these sorts of shocks.

While the Conference highlighted the role that demand has played in explaining commodity price movements, explanations differed about the cause of the rise in demand over the past decade, with some papers attributing it to strong global economic activity and others to speculative demand for commodities. A related issue is whether the much longer-term decline in real commodity prices – driven in large part by rapid productivity growth in resource production and mining exploration and extraction – will reassert itself in the coming decades.

The effects of relative price movements on economies were covered in some depth, with papers demonstrating that the consequences depend on the nature of the shock driving commodity prices and on the underlying structure of the economy, most notably whether countries are net resource importers or exporters.

On questions related to monetary policy, papers emphasise the importance of well-anchored inflation expectations in explaining the lack of sustained general price inflation over the course of the recent commodity price boom. However, there was some discussion among Conference participants about whether certain core-based measures of inflation that tended to exclude the effect of rapidly rising commodity prices but include the slower moving prices of many manufactured goods may have understated latent inflation pressures. Also, it may be that the global recession

interceded to cut off what could have been emerging inflationary pressures in many parts of the world in 2008. The strength of commodity prices of late – even in the face of weak growth prospects in much of the developed world – highlights the value of further work to understand these issues better.

Reference

Cashin P and CJ McDermott (2002), 'The Long-Run Behavior of Commodity Prices: Small Trends and Big Variability', *IMF Staff Papers*, 49(2), pp 175–199.