Globalisation, import prices and inflation: how reliable are the ‘tailwinds’?

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It is sometimes argued that increasing globalisation and openness to trade has exerted downward pressure on inflation in developed countries by, for example, reducing import prices. But, as recent experience of rising commodity prices suggests, globalisation may sometimes be associated with rising import prices. And, even when import prices were falling, the consequences for inflation depended on whether the changes in real incomes brought about were anticipated by households and how monetary policy reacted. Studies that neglect expectations and the role of monetary policy in determining inflation are likely to mismeasure the impact of globalisation on domestic inflation.

Introduction

Rising ratios of trade to world output (Chart 1) and the integration of emerging markets in the global economy (Chart 2) have been key aspects of globalisation. Several of the possible macroeconomic consequences were explored in a recent Quarterly Bulletin article by Spange and Young (2007). These phenomena are having a profound effect on the world economy. But what implications do they have for inflation?

Chart 1 Indices of trade volumes relative to real GDP

![Chart 1: Indices of trade volumes relative to real GDP](image)

Sources: Eurostat, IMF and US Bureau of Economic Analysis.

(a) Trade volumes measured by imports plus exports, ratios set to 100 in 2000.

One possible channel is via the relative price of imports, a change in which is likely to alter the terms of trade (the price of exported goods and services relative to imported goods and services) and hence domestic real incomes. An improvement in the terms of trade, for example, allows some increase in real spending on domestic output (and an increase in its price) without an increase in the overall price index. Or, if spending on domestic output remains unchanged, the overall price index falls, reducing inflation temporarily. As Bean (2006) put it, a ‘beneficial terms of trade shock provides a favourable ‘tailwind’, allowing central banks to run the economy at a higher level of activity than would otherwise have been the case, or else to bring inflation down without having to squeeze down on growth’. But, he also noted, ‘we should not count on it continuing’. If import prices increase relative to the prices of
domestically produced goods and services, as they have been doing in recent months, that has the opposite effect. So the key questions for monetary policy makers are, first, does trade globalisation necessarily improve the terms of trade? And, second, if and when it does so, does the improvement come as a surprise to firms and households or might they anticipate it when they make spending decisions, requiring a different response by policymakers?

This article proceeds as follows. First, it is suggested that globalisation can improve the terms of trade of developed countries. But the conventional wisdom that it does so cannot be relied upon in all circumstances. For example, globalisation may have contributed to the sharp increases in the world prices of oil and many other commodities in the past few years. The emergence of these strong ‘headwinds’ may offset the beneficial ‘tailwinds’. (1)

Second, some empirical work on the impact of increased imports from low-cost emerging market economies on import and aggregate price inflation over the longer run is evaluated. It appears that some of the estimates in the literature are flawed because they do not take proper account of monetary policy and expectations about the impact of globalisation on real incomes. The impact of globalisation on inflation may therefore be exaggerated. Inflation is determined by monetary policy in the long run and there need be no relationship at all between relative price changes induced by globalisation and the overall price level. The importance for policy of the way firms and households form expectations is illustrated in a simple exercise with a forecasting model.

Finally, some possible implications for monetary policy makers are briefly considered. As the current economic conjuncture illustrates, policymakers are likely to have to respond not so much to persistent tailwinds as to occasional gusts, sometimes in the opposite direction.

Globalisation and the terms of trade

The conventional wisdom

Basic textbook trade theory shows how when a country moves from isolation to free trade it benefits by concentrating production in areas where its producers have a comparative advantage, and importing those products that are expensive for it to produce. When it starts to trade, the price of the country’s output rises relative to the price of imports (see the box on page 285).

Typically, the degree of openness changes gradually over time as, for example, transport costs fall. Several other factors associated with globalisation can also improve the terms of trade of developed countries. For example: increases in productivity in emerging market economies as a result of, for example, the diffusion of technologies from developed countries; and increases in the degree of competition in developing countries as foreign businesses find it easier to contest their markets. However, in some circumstances, the ‘terms of trade’ effect may be reduced or reversed, as discussed in the next section.

Why developed countries’ terms of trade may not always improve

First, there can be offsetting effects from the increased world demand for raw materials, as there have been recently (Spange and Young (2007); Mac Coille (2008)). If, for example, countries participating to a greater extent in the global economy grow faster as a result, as is likely, their demand for raw materials will increase faster. That in turn will raise the relative prices of exhaustible natural resources such as oil, gas and metals. Some of the factors behind globalisation, such as falling transport costs, have contributed to the rise in real incomes responsible for the faster increases in demand. However, not all of the increases in demand can be attributed to globalisation. Domestic reforms, for example, have also been important.

Pain et al (2006) estimated how real commodity prices would have differed in 2005 had emerging market economies grown more slowly. Their estimates for oil range from 20% to 40% lower (depending on whether non-OECD economies’ share of trade or of world GDP was assumed to be constant in the counterfactual case). And with more countries becoming more fully integrated into the global economy, the demand for raw materials is likely to increase further.

The increase in the real price of oil in recent years may interrupt the downward trend in transport costs. The distance between the exporting and importing countries is still one of the important factors determining the extent of merchandise trade (Coe et al (2007)). Increasing fuel costs are likely to result in trade flows falling off faster with distance. So one of the forces behind globalisation and terms of trade improvements may be reversed.

Second, increasing development of emerging market economies may lead to the erosion of industrial countries’ technological advantage. Over time, emerging market economies are likely to raise the quality of their products or produce more sophisticated products which command a higher price. The relative price of their products is therefore likely to rise. The relocation of production from developed to developing countries and the diffusion of knowledge about technologies tend to encourage such a movement. The theme of how relocation of industry can erode advanced countries’

(1) See, for example, Lomax (2006). More general scepticism about the impact of globalisation on inflation has been expressed by Ball (2006).
Basic trade theory and the terms of trade

The two most popular textbook trade models follow the Heckscher-Ohlin-Samuelson approach and the Ricardian approach.

In the simplest Heckscher-Ohlin-Samuelson framework, there are assumed to be two countries, two goods, and two factors of production (capital and labour). The home country is assumed to be relatively abundant in capital (typical of a developed economy) and the foreign country relatively abundant in labour (typical of an emerging market economy).

When barriers to trade are insurmountable (‘autarky’), the price of the labour-intensive good in the home country, relative to the price of the capital-intensive good, is higher than that in the foreign country, because labour is relatively scarce in the home country. But under free trade, prices are equalised. For the home country, the relative price of the labour-intensive good is lower under free trade than under autarky and, for the foreign country, the relative price of the labour-intensive good is higher. Each country exports the good that uses its abundant factor intensively, so the home country exports the capital-intensive good and the foreign country exports the labour-intensive good. (The analysis is less straightforward when one or both countries specialises in the production of a single good, and when the assumption about the equal number of goods and factors is relaxed.)

This means that, moving from autarky to free trade, the terms of trade for both countries — the price of domestically produced goods relative to that of foreign imported goods — improves. For the foreign country, the price of the labour-intensive good — its export — rises, while for the home country, the price of the capital-intensive good — its export — is higher.

In the simplest Ricardian framework, there are also assumed to be two countries and two goods, but only one factor of production (labour). Countries have differing technological know-how (rather than different endowments), so that relative labour productivity in producing the two goods differs across countries. Comparing labour productivity across the production of the two different goods, each country produces the good for which this ratio is higher than in the other country. In other words, each country specialises in the good in which they have a comparative advantage, exporting some of this production abroad (assuming that both countries specialise).

As in the Heckscher-Ohlin-Samuelson case, a move from autarky to free trade improves the terms of trade of both countries (as long as the pattern of demand is such that both countries choose to specialise). Thus the country with a comparative advantage in the high-tech industry exports low-tech goods after the move to free trade and the relative price of low-tech goods is lower than under autarky.

In these models, globalisation can affect relative domestic prices as well as import prices by affecting the rewards paid to workers, shareholders and other factors of production. Competition in international markets for goods and services tends to equalise the real rewards paid to two identical factors of production in different countries (under certain strong assumptions, including perfect competition and common access to technologies). Hence goods produced with unskilled labour tend to become relatively cheaper in developed countries while goods produced with skilled labour tend to become more expensive. And globalisation can also alter relative domestic prices by inducing productivity improvements through greater specialisation, economies of scale, offshoring and diffusion of best-practice technologies. So it cannot be assumed that, when the terms of trade change, relative domestic prices remain unaltered.

The impact of moving from autarky to free trade on the terms of trade is less certain in a multi-country setting or when taxes and imperfect competition are included in the analysis (Brenton et al (1997)). It can, for example, lead to more product variety rather than improved terms of trade.
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**Import prices, inflation, expectations and monetary policy**

Several studies have sought to link the effects of globalisation with changes in domestic or import price inflation. They have attempted to quantify the impact of improvements in the terms of trade, falls in the prices of imports relative to domestic production or increased trade with low-cost economies on inflation measures. There have been two broad approaches, one using accounting identities and one using estimated empirical relationships (regressions). This section reviews these approaches briefly before examining how they risk ignoring the key roles of wage and price-setters’ expectations about the impact of globalisation on prices and, more important still, monetary policy.

**The accounting identities approach**

Consumer price inflation can be thought of as reflecting three factors: the inflation rate for domestically produced products bought by households, the difference between that rate and the inflation rate for imports, and the extent of switching by households from domestic products to imports of the same products (or vice versa). The relative inflation factor and the switching factor together are a measure of the impact on the relative prices of imports. Similarly, import price inflation can be split up into the inflation rate for imports from ‘high-cost’ countries (eg developed countries), a relative inflation term capturing the change in the price of imports from ‘low-cost’ countries (eg emerging market economies) relative to the price of imports from ‘high-cost’ countries, and a term capturing consumer switching to imports from ‘low-cost’ countries. Here the relative inflation effect and the switching effect together are a measure of the impact on import price inflation of the participation of ‘low-cost’ countries in trade. The box on page 287 details this accounting decomposition in algebraic terms.

Using this approach, Nickell (2005) found that switching to cheaper imports had reduced UK-weighted world export price inflation by around half a percentage point per year between 2000 and 2004. Mac Coille (2008) estimated a similar impact on UK import price inflation: between 2000 and 2006, the increasing share of UK imports from ‘low-cost’ economies (including the new EU member states and China) reduced annual import price inflation for manufactured goods in the United Kingdom by an average of 0.7 percentage points. The ‘switching’ effect — buying a greater proportion of imports from ‘low-cost’ economies — was larger than the ‘relative inflation’ effect — the impact of lower inflation in the ‘low-cost’ economies. Indeed, the ‘relative inflation’ contribution increased import price inflation in 2003–06. The ECB (2006) carried out a similar exercise for the euro area and found that the downward impact on euro-area import price inflation was around 2 percentage points per year on average between 1996 and 2005. Turning to the impact of import price changes on domestic inflation in general, Pain et al (2006) calculated that imports from emerging economies (primarily China) reduced US inflation, measured using the domestic demand deflator, by 0.1 percentage points per year between 1996 and 2005. For the euro area, there was little effect on inflation from 1996 to 2000, but between 2001 and 2005 the estimated downward impact on inflation averaged 0.3 percentage points per year.

However, these results are better interpreted as describing the magnitude of relative price changes rather than as estimates of the true impact on domestic or import price inflation of the globalisation phenomena considered. Nickell (2005), for example, writes, ‘what we are, in fact, investigating is why goods prices have been falling relative to the general price level. … Ultimately, inflation is the consequence of monetary policy and macroeconomic shocks’. The key point is that some assumption has to be made about what would have happened if the globalisation effects had not been experienced. What would have happened, for example, if the share of trade with the ‘low-cost’ countries had not increased and import price inflation had been the same in the ‘low-cost’ countries as the ‘high-cost’ countries? The studies of import price inflation, for example, implicitly assume that the inflation rate for imports from ‘high-cost’ countries would not have been any different. But, in that counterfactual world, overall import price inflation would have been higher and so would the aggregate inflation.

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(1) This switching effect is only present when there are different import and domestic prices for the same product.
An accounting decomposition for import price inflation

Import price inflation can be decomposed as follows:

$$\Delta p_t/p_{t-1} = \sum_j \left[ \frac{p_{j,t} - p_{HC,t}}{p_{t-1}} \Delta \alpha_{j,t} \right] + \sum_j \frac{\Delta p_{j,t} - \Delta p_{HC,t}}{p_{t-1}}$$

(1)

The term on the left-hand side of equation (1) represents the import price inflation rate. The first term on the right-hand side of equation (1) captures the downward impact on import price inflation from the rising share of low-cost economies.

This term is the price-level difference between each low-cost country j and the high-cost countries multiplied by the change in country j’s share of imports, and represents the switching effect.

The second term in equation (1) measures the contribution from changes in the price of imports from low-cost countries relative to price inflation in the high-cost countries. If the prices of low-cost imports are rising by less than those of high-cost imports, there is a negative contribution to aggregate import price inflation, the relative inflation effect. The third term represents the remaining contribution from import price inflation from the high-cost countries.

(1) See Mac Coille (2008).

rate. But monetary policy under an inflation-targeting regime would have followed a different path in that event, in order to keep aggregate inflation in check, resulting in a different path for import price inflation than assumed. Then the estimate of the impact of globalisation would be different from the one actually calculated.

The regression approach

In the second approach to quantifying the impact of aspects of globalisation on inflation, measures of domestic or import price inflation are assumed to be determined by various variables capturing the effects of globalisation, such as the inflation rate for imports from emerging economies and the share of those imports in total domestic demand. Other variables also have to be included, to capture other influences on inflation, such as the pressure of aggregate demand on supply and changes in unit labour costs and business mark-ups.

Pain et al (2006) provide a good example of this approach, using an error correction model to estimate changes in the private consumption expenditure deflator to changes in import prices, unit labour costs and the domestic output gap for a large set of OECD countries. They estimated that, between 1995 and 2005, globalisation, including the effect via commodity prices, had subtracted up to 0.3 percentage points per year from domestic inflation in the euro area and up to 0.2 percentage points per year for both the United States and the United Kingdom.

Focusing on US import price inflation, Kamin et al (2004) found that the increase in the share of US imports from China had lowered overall US import price inflation by about 0.8 percentage points per year between 1993 and 2002. In a cross-country study using OECD unit value indices, they also estimated that Chinese exports had lowered average annual import unit value inflation in a large set of economies between 1993 and 2001 by about 0.1 to 0.25 percentage points, and by 1 percentage point in the United States (but by nothing in the United Kingdom).

The IMF (2006) has also carried out a study in this vein, which related wage inflation to changes in real import prices, the rate of unemployment, lagged inflation, spare capacity, oil price changes, and a measure of monetary policy credibility to control for shifts in policymakers’ inflation objectives. For a set of advanced economies, the fall in real import prices contributed around 0.5 percentage points to the reduction in inflation in 1998 and 1999 and around 0.25 percentage points in 2002. For the United States, the estimated impact was larger.

Finally, Chen et al (2004), in an investigation of industry-level output prices, found that an increase in economies’ openness was responsible for a fall in aggregate manufacturing output price inflation of up to 0.14 percentage points per year across EU countries between 1988 and 2000.(1)

As with the accounting identity approach, though, the estimates of the impact of globalisation on overall or import price inflation tend to give insufficient weight to a key point: even if globalisation does reduce certain relative import prices, if the monetary policy stance is directed towards overall price stability (eg through inflation targeting), that stance would have been different in the absence of globalisation. Hence the paths of the explanatory variables would have been different without the change in the extent of globalisation. The overall impact on inflation cannot be calculated simply by reference to the changes in the variables measuring globalisation effects and their estimated coefficients.

(1) Chen et al (2004) in their study of manufacturing prices use aggregate price changes as an explanatory variable in one variant, so their results should be interpreted as measuring impacts on the relative price of manufactures, not manufacturing price inflation as such.
Monetary policy and expectations

The qualifications about the interpretation of results from both the accounting identities approach and the empirical approach reflect the difficulties of attempting to explain inflation variables without bringing two key factors into the story: first, how people’s expectations of future incomes and relative prices are affected by globalisation and its consequences; and, second, the response of monetary policy.

The impact of globalisation depends on the extent to which its consequences are anticipated by businesses and households. If, for example, the fall in relative import prices is sudden and unexpected, there may be a temporary impact on overall inflation if other prices are slow to adjust. Producers would experience an increase in demand for domestic products, brought about by the real income increases generated by the terms of trade improvement. Over time, that would then push up inflation rates for domestic products. But if domestic price-setters fully anticipate the falls in import prices and believe that monetary policy makers are committed to an aggregate inflation target, prices for domestically produced goods and services would be raised faster and aggregate inflation might not fall at all.

If businesses and households expect the benefits of globalisation to increase over time but monetary policy is not sufficiently forward looking, globalisation-induced improvements in the terms of trade could lead to a temporary increase in inflation. A fall in the relative price of imports expected to last for some time would encourage people to consume more today, as they anticipated their real wages increasing faster in the future (their ‘permanent income’ has risen). That would cause a rise in demand relative to supply, pushing up all prices, unless monetary policy tightened in time to cancel out the effect.

Omitting monetary policy from the story can also lead to misinterpreting the cause of relative price changes. Suppose that policymakers in an economy with high inflation decide to bring the inflation rate down and tighten the monetary policy stance accordingly. That entails temporarily higher nominal interest rates than elsewhere and an initial appreciation in the domestic currency. The disinflationary impact of policy acts partly through import prices in this example. So in this instance it would be wrong to interpret the coefficient on import price inflation in a regression purporting to explain aggregate consumer price inflation as a measure of the impact of globalisation.

Hence one problem with the reduced-form regression approach is that it excludes an explicit role for inflation expectations or monetary policy in influencing inflation. If inflation expectations fell over the estimation period because of a change in monetary policy credibility, for example, their omission from the regression is likely to lead to an overestimate of the sensitivity of domestic price inflation to the fall in the price of imports. Young (2008) reviews a range of possible explanations for the period of low inflation, several of which would not be adequately captured by the empirical methods discussed here.

In some of the studies mentioned, an effort has been made to counter the objection that the approach ignores monetary policy by including a proxy for changes in the monetary policy regime as an explanatory variable. But that does not allow for the possible feedback from globalisation effects and inflation to inflation expectations and the nominal interest rate set by monetary policy makers under any particular regime.(2)

A simulation exercise

These arguments point to the desirability of considering the impacts of the factors driving globalisation within a general equilibrium model that: provides explicit links between nominal variables, such as the nominal exchange rate, and real variables; incorporates a treatment of expectations; and allows for a monetary policy reaction. That would be an ambitious project, but the potential quantitative importance of such an approach can be illustrated with a hypothetical exercise in which the impact of an improvement in the terms of trade is explored in the Bank of England’s forecasting model BEQM (without making any assumption about the reasons for the fall in relative import prices). For simplicity’s sake, and to allow us to focus on the impact of different assumptions about how households form expectations, monetary policy is represented by a backward-looking ‘Taylor rule’. This means the policy interest rate is set in response to deviations of inflation from target and of output from potential (the ‘output gap’), as well as lagged nominal interest rates. This is not a satisfactory characterisation of, for example, a forward-looking inflation-targeting central bank. But the implications of more forward-looking behaviour by the central bank are discussed below.

First, a permanent fall in import prices, relative to sterling-denominated world export prices, of 1% is assumed.(3)(4) Businesses and households in the model do not expect the fall, but treat the improvement in real incomes as permanent. In the short run, inflation falls (Chart 4), but then rises after around two years, staying higher than in the base case out to around ten years. That reflects the mounting impact of the increase in domestic wealth and real income on

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(1) Lagged measures of inflation, used in some studies, can be argued to be a proxy for inflation expectations. But as well as being a questionable assumption, that rules out responses of expectations to changes in the explanatory variables related to globalisation being anticipated.

(2) The IMF uses a measure of monetary policy credibility derived from long-term government bond yields, but it is unlikely to capture fully the impact of relative price changes on expectations and the monetary policy stance.

(3) This exercise is as reported in Harrison et al (2005) in their discussion of BEQM model properties. See Chapter 7, especially pages 141–45.

(4) This is very similar to the average annual improvement in the UK terms of trade from 1975 to 2005.
output, which puts pressure on factor utilisation (Chart 5) and hence domestic prices. So, in this simulation, the ‘tailwind’ turns into a ‘headwind’. Given the assumed simple Taylor rule, monetary policy responds initially by cutting interest rates to offset lower inflation, before tightening in response to the increase in inflation over the medium term (Chart 6).

In a second simulation, a series of improvements in the terms of trade annually over five years are implemented but households fully anticipate the future improvements, after experiencing the first one, so the size of the initial surprise about expected real incomes over time (‘permanent income’) is larger than in the first simulation. For simplicity’s sake, however, and to focus on the impact of households’ expectations, the central bank is still assumed to follow its backward-looking policy rule, even though households anticipate future developments in the terms of trade. Because households fully anticipate the rise in their real incomes in future years, they increase their spending straightaway, and by more than in the first simulation. So after an initial period when import price inflation is negative and domestic pricing is still ‘sticky’, overall inflation rises more sharply, with a higher peak, as domestic prices adjust to the larger increase in real incomes. Higher inflation co-exists with continuing (but anticipated) terms of trade improvements. In this example, the terms of trade improvements generate more powerful headwinds.

However, the second simulation exaggerates the likely upward impact of the terms of trade improvements on inflation because of the simplifying assumption that the central bank is backward looking and cannot anticipate the consequences of continuing gains from globalisation. In practice, the central bank, like households and businesses, will start anticipating future gains. It would therefore increase its policy rate to counter the increase in nominal demand that it expected, thus reducing the subsequent increase in inflation. There would be no tailwinds persistently reducing inflation or the policy interest rate; but the rise in inflation would be kept in check more effectively too.

The exercise highlights the need for policymakers to assess whether improvements in the terms of trade are indeed a surprise to households and businesses or whether people anticipate the development, at least to some extent. In practice, there was a trend improvement in the UK terms of trade from the mid-1970s until the middle of this decade, although with considerable volatility from year to year. So it seems reasonable to suppose that the trend improvement might have become incorporated in people’s expectations over time (whatever its origin). More recently, with import prices rising relative to prices of domestically produced goods and services, one challenge for policymakers has been to assess how long that relative price movement will persist and whether it is being incorporated in expectations.

**Conclusions**

Conventional trade theory suggests that the integration of emerging market economies in global trade is likely to have contributed to the improvement in the United Kingdom’s terms of trade from the mid-1970s to the mid-2000s, other
things being equal. But some of the consequences of
globalisation, such as an increase in the demand for raw
materials and technology transfers, may at times offset the
rise in the terms of trade. A number of factors have influenced
the UK terms of trade in practice and globalisation does not
always appear to have had the dominant effect.

Even when in the past globalisation has been reducing relative
import prices, the implications for domestic inflation have
been far from obvious. Some estimates may have exaggerated
the impact by failing to model properly the formation of
expectations about real incomes and the response of
monetary policy. The inadequate treatment of monetary
policy means that falls in inflation due to improved monetary
policy frameworks and falls in inflation expectations may have
been incorrectly attributed to globalisation and lower relative
import prices.

To tackle these issues, a more explicit model of aggregate
inflation has to be used, one that both takes account of the
differences between unexpected and expected relative price
changes and allows for monetary policy reactions to new
developments. The simulation exercise in this article gives an
illustration of how such an approach may, under certain
assumptions, reverse the traditional wisdom. It suggests that
large and unexpected developments in relative import prices
can indeed affect domestic inflation in the short run,
particularly when expectations about future real incomes are
affected, but not necessarily in the direction commonly
supposed. Monetary policy may have to be tighter, rather
than looser, than otherwise if people extrapolate the benefits
of globalisation into the future. But gradual changes in relative
prices, to which monetary policy and expectations have an
opportunity to adjust, are less likely to have a significant effect
on inflation even in the short run.
References


