Relative Prices, Inflation, the Terms of Trade and the Policy Targets Agreement

This article, by David Archer, discusses the distinction between relative price changes and inflation, and notes how the Policy Targets Agreement deals with the distinction, with particular reference to changes in the terms of trade.

Summary

In principle, relative price changes do not imply inflation or deflation even when the relative price change is sufficiently large to impact on the aggregate price level. Inflation and deflation are ongoing processes, involving a generalised movement of all prices in the same direction.

In practice, however, pure relative price changes are difficult to disentangle from inflation processes. Inflation can show up initially as relative price changes, and relative price changes can spark inflation. The problem of interaction between relative price changes and inflation processes stems from the fact that nominal prices of goods and services reflect both the relative worth of individual goods and services, and the overall level of prices in terms of a numeraire.

If the aggregate level of prices were highly likely to remain stable, movements in nominal prices could be taken to be relative price signals. Though the idea of aggregate price level stability has been credible on occasions in history, the 20th century has significantly undermined the credibility of price stability.

New Zealand is in the process of restoring the credibility of price stability, though it remains early days. In order to restore that credibility, clear and monitorable inflation targets for monetary policy are desirable. New Zealand has chosen a target of 0 to 2 percent inflation. Such a target, unless qualified by exceptions or caveats, would restrict the extent to which a relative price change can impact on the aggregate price level without other relative prices being forced to adjust in the opposite direction. Forced offsetting adjustments in other relative prices involve economic costs, but allow gains in terms of certainty and faster acquisition of credibility.

Recognising the tradeoff between costs of forced relative price adjustment and the gains to credibility from a tightly specified target, the Policy Targets...
Agreement (PTA) includes clauses that contain caveats to the 0 to 2 percent inflation target. These caveats provide for circumstances in which large relative price shocks are allowed to impact on the aggregate price level, but within an overall framework that makes prevention of ongoing inflation and deflation the overriding concern.

One caveat deals with relative price shocks in the form of changes in the terms of trade caused by movements in the world price of exports and imports. Analysis, set out in this article, shows that there are some circumstances in which the terms of trade caveat might not sensibly be invoked. In particular, export price shocks can lead to developments in incomes, expenditure, and the nominal exchange rate that are at the same time consistent with desirable real sector adjustment and with maintenance of price stability. Additionally, invoking the terms of trade caveat in response to some export price shocks might add to subsequent inflation or deflation pressures.

However, it is not the case that all significant export price changes ought be prevented from impacting on the aggregate price level. Hence the specification of the PTA caveat dealing with the terms of trade covers export price shocks as well as import price shocks, but the application of the caveat is a matter for the Reserve Bank’s judgement, depending on the circumstances at the time.

Introduction

The Reserve Bank of New Zealand Act 1989 establishes price stability as the single macroeconomic policy objective of monetary policy, and the Policy Targets Agreement, pursuant to the Act, makes 12 monthly movements in the CPI of between 0 and 2 percent the concrete representation of this objective.

If this were all that the Policy Targets Agreement said about the target, monetary policy would be required to aim at keeping inflation between 0 and 2 percent at all times and in all circumstances. However, the PTA allows for some circumstances where inflation, measured by the CPI (hereafter called the “headline” rate of inflation), can be permitted to deviate temporarily from the 0 to 2 percent range, without this being seen as a “failure” of monetary policy. Collectively, these circumstances (or, more accurately, the clauses that describe the circumstances) are known as the “caveats.”

A Box later in the article details the caveats contained in the current PTA. In general, the caveats refer to circumstances where a “shock” has occurred to the economy — specifically a shock that has direct implications for prices and thus the measured rate of inflation. Invoking a caveat in such circumstances means that monetary policy would not necessarily act to prevent headline inflation from going outside the 0 to 2 percent range, for a short period.

Reserve Bank Bulletin, Vol 56, No. 4 1993
The first section of this article discusses, in very general terms, the distinction between relative prices and inflation, and the relationship of each with monetary policy. This distinction lies behind the rationale for the caveats to the 0 to 2 percent inflation target, which is discussed in the second section. The third section discusses the caveat that deals specifically with movements in the terms of trade.

Relative Prices, Inflation, and Monetary Policy

The role of prices
To appreciate the need for the caveats, it is first necessary to understand the role of prices. Prices play several roles. Two, in particular, are relevant to the issue of monetary policy and the PTA caveats.

First, prices of individual goods and services represent or indicate the value of that good or service, relative to other goods and services. How relative values are determined is something that is well beyond the scope of this article, but it suffices to say that the process is one of interaction of demand and supply as expressed in the economic behaviour of people and organisations, both here and abroad. To help the exposition, this aspect of prices will be referred to as “relative” prices.

“Nominal” prices is the label that will be used to refer to the second role of prices. To understand this role, one needs to recognise that, in principle, relative prices can be expressed in any unit. For many reasons, modern economies express prices in terms of units of national money. Such units are, at heart, arbitrary or nominal — hence the term “nominal” prices. The price of an ice cream today might be $1.50 and of a car might be $30,000. (In this case, the relative price is 30,000/1.50=20,000.) But the prices of these products might equally be #150 and #3,500,000 respectively, if a different unit of account (or “numéraire”) — represented by the # symbol — were in use.

Inflation involves changes in all prices, expressed in the same unit of account. Inflation is the process that takes the price of an ice cream from $0.15 some years ago to $1.50 now, at the same time as taking the price of a car from $3,000 to $30,000. For the most part, inflation does not involve a change in relative prices — the relative price of ice creams and cars is the same in both examples (3,000/0.15=20,000) — though as a by-product of inflation, some relative prices might be affected.

The nominal role of prices thus captures both the inflation process, and the relative role of prices. Inflation is important to economic behaviour precisely because of this. If the inflation and relative price aspects of prices were fully distinguishable, there would be little potential for confusion, and equally little prospect of inflation affecting relative prices as a by-product. But, as the two aspects are not distinguished automatically, any assessment of the level and movement of the price of goods and services must involve an attempt to differentiate between changes in relative prices and changes in the overall price level resulting from inflation.

---

1 Some impact on economic behaviour and relative prices would always be present, in the presence of inflation, so inflation would always be distortionary. For a discussion of this, and an explanation of the costs of inflation when inflation is fully anticipated (i.e. it does not affect perceptions, at least, of relative prices), see JOHNSON, Samantha “The Costs of Inflation Revisited” Reserve Bank Bulletin, 56(1), March 1993.
Relative price changes are a perfectly normal, and indeed essential, part of economic systems. Although there can be instances in which relative prices move in ways that do not adequately reflect the best use that an economy might make of the resources available to it, for the most part movements in relative prices do indeed signal the need for a change in resource use that is in the best interests of society. This is one of the key distinguishing features of a healthy market economy, and contrasts strongly with the resource allocation mechanisms of the formerly centrally planned economies.

**Price Indices**
Conceptually, therefore, the distinction between relative price changes and inflation is straightforward. Inflation is an ongoing process of prices increasing in relation to the unit of account or numeraire, and has little or nothing to do with signals of needed adjustment in resource allocation.

The rub, however, is to distinguish the one from the other, given that nominal prices reflect both inflation and relative price changes. If we were dealing with a handful of prices of individual goods and services, it would be easy enough to observe whether all prices were moving by the same amount, or alternatively whether one price or group of prices was moving relative to others. In complex economies, this is not easily done. To help measure overall price movements, composite measures of indices or prices can be calculated. The Consumers Price Index (CPI) is but one of several price indices that are calculated.

Price indices measure nominal prices of a wide range of goods and services. Some price indices, such as the CPI, are very general in their coverage, and as such are thought of as capturing or measuring overall prices, or aggregate prices. Using an aggregate price index, it should in principle be fairly straightforward to apply the distinction between relative prices and inflation outlined above. Relative prices, involving nominal prices moving relative to each other but, by definition, not all in the same direction, should not lead to movement in the aggregate price index. Inflation, on the other hand, being a process involving movements in the nominal price of all goods and services, will result in an increase in the price index.

**Relative price changes that impact on aggregate price indices**
This simple dichotomy does not, however, work out very well in practice. For relative price changes to leave the aggregate (nominal) price level unchanged, increases in nominal prices of goods and services rising in relative value would have to be exactly offset by falls in nominal prices of goods that are declining in relative value. But changes in nominal prices are not produced automatically out of a huge computer that constantly juggles nominal prices to allow changes in relative prices while keeping aggregate nominal prices unchanged. Nominal prices are set by the actions of individuals and organisations, responding to the economic forces that show up in demand and supply.

To illustrate this point, in a simple world with only a few goods, an increase in the value attached to one of those goods (because, say, tastes changed) would initially lead to more people wanting to buy that good at the price currently charged by the supplier. As the good became scarce on the shelves, and to cover the additional cost of producing more, the supplier would raise the price of the good now in greater demand. (At this point in the process, the aggregate price level will have increased.) If nominal incomes remained
unchanged, less income would now be available to purchase the other goods, since higher consumption of, and/or the higher price of, the good now in greater demand would command a higher proportion of available income. Suppliers of other goods would, as a result, be unable to sell all they wanted to at the current price, and would be forced to reduce prices. (At this point, the aggregate price level falls back.)

In this highly simplified example, it can be seen that an unchanged aggregate price level after a relative price change is the end product of a process whereby other prices are forced to adjust. Usually, price movements that are not fully anticipated involve economic costs. In the example given, the costs would have been associated with suppliers being unable to sell all they wanted which, unless fully anticipated, would likely have shown up initially in excess inventory levels, the holding or disposal of which would in turn involve costs. In principle, these costs of adjustment of prices apply in both the upwards and downwards directions.

Events that generate changes in relative prices typically are fairly evenly distributed between events that push the first-affected prices upwards and those that push the first-affected prices downwards. This being the case, even though the overall price level moves as the impact effect of the price "shock" occurs, upwards and downwards movements in the overall price level would tend to even out. Predominately upwards movements in prices during inflationary times are a product of the additional forces generated by the behaviour of monetary policy, rather than the nature of the relative price adjustment process.

Monetary policy, price indices, and relative prices
As noted, if relative price shocks were reasonably evenly distributed, and if monetary policy did not impart an upward bias to nominal price movements, the aggregate price level should remain roughly stable over time. In the very short term, however, it might bounce around considerably. In the United Kingdom, for example, the overall price level in the 19th century showed no appreciable trend in either direction, but the extent of movement in aggregate prices was as much as plus or minus 10 to 15 percent in a year.

Except in certain circumstances, spillover from relative price movements to aggregate price movements, even of the order of magnitude experienced in the 19th century United Kingdom, should not be of particular concern. The aggregate price level movement reflects only the movement in prices of particular goods whose relative price is changing, which is, as noted, in general a healthy process. Given that, it would follow that monetary policy ought not seek to prevent or offset the price level shift in such cases.

There are, however, two broad categories of circumstances in which a spillover from relative price movements to the aggregate price level would be of concern.

The first category relates to circumstances where one of the conditions noted at the beginning of this section is violated — namely, where monetary policy does in fact impart an upward bias to nominal price movements. Because some prices react faster than others, a monetary shock (for example, an easing in liquidity, caused by the central bank, and reflected in lower interest rates and a lower exchange rate) would initially generate relative price changes. Such relative price changes, and their impact on the aggregate price level, would be precursors — indeed part of — an inflation process, and
concern would clearly be warranted. Similarly, some relative price changes that are not
initiated by the actions of the central bank can also reflect the beginnings of, or part of,
an inflation process. For example, a rise in the prices of goods and services, and/or
wages, prompted by an expectation of monetary policy accommodation of higher
inflation in the future, would probably first show up as relative price changes. Another
instance of relative price changes that are part of, or could lead to, an inflation process,
is where the nominal exchange rate depreciates in the expectation of a future easing of
monetary policy. In each of the cases discussed in this paragraph, the initial relative price
changes would not be offset by price shocks in the opposite direction. Thus, it clearly
cannot be assumed that all relative price changes should be accommodated by monetary
policy.

The second category of circumstances where a spillover of relative price changes to the
aggregate price level would be cause for concern involves situations in which relative
price movements were misinterpreted as the onset of an ongoing inflation or deflation
process. Misinterpretation that an inflation process is getting under way, for instance,
would lead price and wage setters to attempt to push up the prices of other goods and
services and wages. If such price adjustments were accommodated or facilitated by an
easing of monetary policy, an inflation process would indeed get under way, with costs
to economic efficiency and welfare. Misinterpretation would have turned into a self-
fulfilling prophecy. Alternatively, if such price adjustments were not accommodated by
an easing of monetary policy, a reversal of the initial upward adjustments of prices would
be forced, as inventories of unsold goods and services accumulated and unemployment
rose. Again, economic costs would be involved.

A long history of price stability in 19th century Britain was probably sufficient to prevent
such misinterpretation. Perhaps in time the same will be able to be said about New
Zealand, but our relatively recent history of chronic inflation would suggest that the time
is some distance off. Full and effectively unquestioned credibility does not come
quickly.

Absence of full credibility, difficulties in distinguishing inflationary and non-inflation-
ary relative price changes, and the costs associated with inflation, are the main reasons
why monetary policy would seek to forestall or prevent most or all aggregate price level
movements. In New Zealand and Canada, the specification of target inflation rates
involve a range of only two percentage points. Thus, for New Zealand, during the course
of 12 months the aggregate price level should not fall, or rise by more than 2 percent.
These relatively narrow limits to the short term movement in the aggregate price level
reflect primarily the need to establish an obvious, public, and clearly monitorable target.
In the absence of historical credibility in the pursuit of price stability in this country, a
transparent and tightly defined target allows the commitment to price stability to be
revealed in results more readily than would be the case with a non-transparent or loosely
defined target.

The Caveats in the Policy Targets Agreement

As the foregoing discussion will have made clear, tying down the aggregate price level
so that it never deviated by more than one percent either side of the midpoint of a target
range, is likely to have implications for the way in which relative price adjustments are
handled. Movements in some individual prices that would impact on the aggregate price

Reserve Bank Bulletin, Vol 56, No. 4 1993

365
level enough to push inflation outside the target range would require offsetting adjustments of other prices in order that the aggregate price level movement stayed within the target limits. And, as noted, downward price adjustments are generally costly.

For this reason, the Policy Targets Agreement makes provision for circumstances where certain types of relative price adjustment can be allowed to spill over into a movement in the aggregate price level larger than that allowed by the 0-2 percent target. The part of the PTA that contains these “caveats” is reproduced in the Box below. A number of points about the specification of the caveats should be noted.

First, the PTA states quite plainly that deviations of headline inflation from the price stability range should be temporary, and that the main task of monetary policy is to prevent a spillover from the shock to generalised, ongoing, inflation.

Second, the caveats can only be invoked in relation to shocks that have a significant impact on the rate of inflation. What constitutes a “significant” impact is not defined, and it may indeed vary from circumstance to circumstance. The main idea, though, is to strike a balance between two extremes. On the one hand, given that economies are being subjected all the time to a myriad of shocks that change prices of specific goods and services, having too low a threshold on “significant” would mean making a “regular” monetary policy stance the exception rather than the rule. Monetary policy’s intent would become quite hard to read. On the other hand, if the threshold were so tough as to prevent any relative price changes affecting inflation temporarily, then the stance of monetary policy might need to swing excessively from tightness to looseness in order to keep inflation inside the 0 to 2 percent range.

Third, for a caveat to be legitimately invoked, the shock must emanate from a disturbance or event that is outside the ambit of New Zealand’s monetary policy. To allow otherwise would be to undermine the price stability objective and the Bank’s accountability for chasing that objective. For instance, a nominal wage shock (e.g. a sharp increase in the rate of wage inflation) is over time within the ambit of monetary policy, in the sense that significant rates of wage inflation or deflation cannot occur without the accommodation of monetary policy. Equally, a nominal exchange rate shock is ultimately tied back to monetary policy, since, for a given real exchange rate (determined by the fundamentals that govern a country’s competitiveness), the trend in the nominal exchange rate reflects the relative rate of inflation between New Zealand and elsewhere. If nominal wage and exchange rate shocks were legitimate grounds for monetary policy to allow a departure from the 0 to 2 percent price stability range, inflation would not be tied down.

Fourth, the specification of the caveats is not prescriptive or exclusive. Shocks not specifically mentioned in the PTA, but similar in character to those mentioned, might call for a reaction from monetary policy akin to that allowed in response to the shocks mentioned. Equally, in the face of such shocks, the caveats need not always be invoked. For example, if the Bank judged that a significant impact on the headline rate of inflation did not actually threaten to break headline inflation outside the 0 to 2 percent range, there would be no need to change monetary policy responses. Alternatively, if the range was threatened, and the Bank judged that to permit headline inflation to move outside the range in response to the impact effect on prices of the shock would be too risky in terms of controlling the downstream indirect impact on inflation, the caveats might not be invoked.
"3. Deviations from the Targets

(a) There is a range of possible price shocks arising from external sources, certain government policy changes, or a natural crisis which are quite outside the direct influence of monetary policy. The Bank shall generally react to such shifts in relative prices in a manner which prevents general inflationary pressures emerging.

(b) This approach means that the CPI inflation rate can be expected to move outside the 0-2 percent range in response to particular shocks. The principal shocks are considered to be:

- significant changes in the terms of trade arising from an increase or decrease in either import or export prices;

- an increase or decrease in the rate of GST, or a significant change in other indirect tax rates;

- a crisis such as a natural disaster or a major disease-induced fall in livestock numbers which is expected to have a significant impact on the price level;

- a significant price level impact arising from changes to government or local authority levies; and

- a movement in interest rates that causes a significant divergence between the change in the CPI and the change in the CPI excluding the interest costs component.

(c) In the event of such shocks, the Reserve Bank shall be fully accountable for its handling of the price effects, and, in particular, for any movements outside the 0-2 percent band. In each Policy Statement made under section 15 of the Act, the Bank shall detail fully its estimate of the direct price impact of any such shock and the impact on the Bank’s achievement of the price stability target. The Bank shall also detail what measures it has taken, or proposes to take, to ensure that the effects of such shocks on the inflation rate are transitory."
Finally, whenever a caveat could be, or is invoked, the Bank is required to fully and publicly explain and justify its policy response. The source and nature of the shock would have to be identified, and the estimated direct impact on inflation quantified. How much of the direct impact will be allowed to feed through into headline inflation, and over what period, would have to be set out, as would the nature of the policy that will be put in place to prevent generalised inflation emerging.

The Terms of Trade Caveat

As indicated by the Box, included among the situations that might warrant allowing inflation to move temporarily outside the 0 to 2 percent range are “significant changes in the terms of trade arising from an increase or decrease in either import or export prices.” Though expressed in apparently simple terms, the terms of trade caveat in fact covers a wide range of circumstances that might potentially have quite different implications for inflation and monetary policy. In this regard, it differs from the caveats that cover the other price shocks specifically mentioned.

Technically, the “terms of trade” can be defined in a variety of ways, the appropriate definition being determined by a range of factors including the size and openness of the economy, the extent to which changes in the economy affect prices of internationally tradeable goods and services, etc. For the purposes of this discussion, however, it is sufficient to refer to the ratio of export prices to import prices — both in foreign currency terms — as the terms of trade.

The terms of trade is a key relative price in the economy — or, more strictly, a composite of key relative prices. Because New Zealand is so heavily dependent on foreign trade (exports and imports both account for close to one third of GDP), the terms of trade is a major determinant of the real living standards of the country as a whole, not simply of those who produce exports or purchase imports. For example, an increase in the price of exports relative to imports (an increase in the terms of trade) increases the real purchasing power — or equivalently, the real income — of New Zealanders by increasing the volume of imports that can be purchased from overseas from the earnings on an unchanged volume of exports.

At a more detailed level, the effect on overall real incomes arises because of the initial impact of a terms of trade change on the (real) incomes of exporters and importers, which is then reflected in the levels of their demand for other goods and services (including labour). This has the normal ‘multiplier’ effect on the incomes and expenditure of other suppliers and purchasers in the economy.

Exactly where and how these sorts of effects are felt depend on which prices within the terms of trade measure are changing, and to some extent also on whether the changes are seen to be temporary or long-lasting. A terms of trade increase, for example, can come about either because export prices rise (faster than import prices), or import prices fall (faster than exports), or some combination of these developments. Since New Zealand is predominantly a price taker, rather than a price setter in both export markets and import markets, movements in the terms of trade result virtually entirely from international developments. Export price changes in foreign currency terms result either from shifts in international demand for products we export, or shifts in supply from the major
overseas suppliers with whom we compete. Similarly, import price changes (in foreign currency terms) result from shifts in international supply conditions for the relevant products, and from changes in the strength of international demand for these products.

**Terms of trade movements and aggregate domestic prices**

Changes in the international prices of traded goods relevant to New Zealand will, in general, affect the aggregate price level in New Zealand through both direct and indirect channels. Direct channels are fairly obvious. Both export and import prices prevailing in international markets are relevant to decisions of New Zealand producers and consumers, and are likely to be more or less fully reflected in local market prices for these goods. In the case of exports, the goods and services that are exported are typically also consumed locally, so both producers and consumers will react to changes in export prices. For example, if beef prices rise in overseas markets, beef prices are likely also to rise in New Zealand. If beef prices did not rise in New Zealand, beef producers would direct more of their output offshore, which would subsequently force up onshore prices as shortages developed.

The indirect effects arise because of the impact on sectoral incomes and demand, and the consequent feed-through to aggregate income and demand noted above. Indirect effects also arise when a change in the terms of trade has an effect on the exchange rate, which can sometimes offset, and sometimes reinforce the other effects on the domestic price level. (The implications of this latter point are discussed later.)

Notwithstanding the effects on aggregate income and demand, there is no automatic relationship between the terms of trade and the strength of inflation pressures in New Zealand. Indeed, if export prices and import prices happened to be increasing, or decreasing, at much the same rate, the local inflation outlook could be changing significantly while the terms of trade stayed constant.

More fundamentally, a change in the terms of trade reflects, in the first instance, a shift in relative prices and incomes in favour of some products and sectors which, though it may affect the aggregate price level, essentially does so on a one-off basis. As long as the effect remains of a one-off nature, this relative price shift has no implications for inflation, which is an ongoing process of generalized price increases. Inflation only becomes an issue if the indirect effects of the terms of trade change feed into ongoing domestic inflation pressures that are accommodated by monetary policy.

**The time dimension of terms of trade changes**

As hinted at earlier, a potentially important determinant of the nature and strength of indirect responses to changes in the terms of trade is the permanence or otherwise of the change — or, more accurately, peoples’ expectation of this. Because changes in prices and production are costly, to a greater or lesser extent, a blip up or down in international trade prices that is expected to be reversed in short order would induce fewer changes than a movement that is expected to be permanent. The longer the expected period before a reversal of the trade price shift and the lower the cost of adjustment of domestic prices and production and consumption patterns, the more likely and greater will be changes in economic behaviour.
A similar issue arises in respect of cyclical variations in trade prices. As international economic cycles occur, international trade prices also tend to follow cyclical patterns. At the margin, some change in economic structure might occur in response to cyclical phenomena. For the most part, however, production patterns are quite costly to adjust, and will not adjust much in response to cyclical movements in trade prices. But cyclical variations in the terms of trade are relevant to the way in which the exchange rate adjusts as trade prices and economic circumstances alter. It is to this issue that we now turn.

The terms of trade and the exchange rate
As already noted, changes in the terms of trade can have an important impact on real incomes, and production and expenditure patterns. Directly, through changes in the nominal value of given volumes of exports and imports, and indirectly, through the income and expenditure channels, terms of trade changes also affect the balance of payments. Permanent increases in the terms of trade usually result in an improvement in the current account of the balance of payments, and vice versa, although this outcome does depend on a range of factors that could equally dissipate all potential gains from an improvement in the terms of trade and leave the long-run current account unaltered. One important factor is the behaviour of the exchange rate.

Where a long-run improvement in the balance of payments is the tendency in response to an improvement in the terms of trade, the real exchange rate is likely to appreciate. The real exchange rate is a relative price that reflects the competitiveness of a country’s tradeable goods and services sector. It can be defined, and thought of, in a number of ways — for example, as a measure of the competitiveness of tradeable goods and services production relative to non-tradeable production within a country, or as a measure of the competitiveness of tradeable production relative to tradeable production elsewhere in the world. However thought of, though, the real exchange rate relates to the nominal exchange rate in much the same way that relative prices relate to nominal prices. A substantial part of the nominal exchange rate simply reflects inflation, both here and abroad, while some element of the nominal exchange rate reflects underlying relative prices.2

An appreciation of the real exchange rate in response to an improvement in the terms of trade can in part, therefore, come about through an appreciation of the nominal exchange rate. The nominal prices of exports and imports are usually strongly affected by changes in the nominal exchange rate. (An appreciation of the New Zealand dollar against the yen, for example, will typically lead to a reduction in the New Zealand price of Japanese goods, after a time.) In turn, changes in the New Zealand prices of exports and imports impact on the aggregate nominal price level. Hence, the direct impact of changes in international trade prices on the aggregate nominal price level in New Zealand, and the indirect impact through income and expenditure channels, is modified by resulting adjustments of the nominal exchange rate.

Over time, changes to the real exchange rate are a prime motivating factor for production effort to shift from the non-tradeable sector to the tradeable sector and vice versa, and/or a reflection of other factors that induce such resource shifts. It is inefficient, however,

---

for resources to shift substantively in response to temporary phenomena. Cyclical changes in the terms of trade, therefore, would have little impact on the equilibrium real exchange rate, which is a concept of relevance to the medium term.

Terms of trade - summarising the interactions
Drawing the elements of the discussion together, we can categorise the various types of shocks to the terms of trade, their implications for real and nominal exchange rate adjustment, and their implications for the aggregate price level, together in a way that allows the implications of the PTA terms of trade caveat to be illustrated. This is done in a simplified fashion in the following table. Important qualifications to the representation set out in the table need to be borne in mind, especially in respect of the implications for the terms of trade caveat, and some of these are discussed later.

For each of eight simplified categories of terms of trade shock, the table indicates the movement in the nominal exchange rate that would be most consistent with maintaining or reestablishing the equilibrium real exchange rate. That direction of movement is shown in the third to last column.

<table>
<thead>
<tr>
<th>Terms of Trade Shocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source of shock</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>Export price change</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Import price change</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Reserve Bank Bulletin, Vol 56, No. 4 1993
Also included in the table, in the second to last column, is the direction of movement of the nominal exchange rate that would be most consistent with maintaining price stability. In each case, the desired direction of movement of the nominal exchange rate is determined by the initial or first round impact of the change in the trade price on the aggregate price level. Increases in trade prices would need to be offset by falls in other prices in order to hold the aggregate price level unchanged. Monetary policy, which operates through interest rates and the exchange rate, would thus look for an appreciation of the nominal exchange rate, which in turn would push down the prices of tradeable goods and services. For a terms of trade shock that involves a fall in trade prices, the opposite movement in the nominal exchange rate is most consistent with holding the aggregate price level unchanged.

Of special interest to the issue of the terms of trade caveat in the PTA, there are two instances indicated in the table where the direction of movement of the nominal exchange rate that is most consistent with reestablishing real exchange rate equilibrium is the same as that most consistent with maintaining price stability. Both instances relate to permanent export price changes. In these situations, the direct impact on the aggregate price level of the export price movement would be offset or moderated by the impact on the aggregate price level of the likely movement in the nominal exchange rate, as the nominal exchange rate reacted to pressures to maintain real exchange rate equilibrium. Consequently, not only would it potentially be unnecessary to invoke the PTA caveat to permit inflation temporarily to move outside the target range, it would also be inconsistent with the desirable movement of the nominal exchange rate consistent with real exchange rate adjustment.

Clearly, given the above, not all circumstances where a trade price movement would impact significantly on the aggregate price level would warrant invoking the caveat that covers the terms of trade. There are, in addition, other reasons why the terms of trade caveat might sensibly not be invoked, even where the trade price movement is significant.

As noted previously, movements in the terms of trade have implications for the real incomes of tradeable goods sector producers, and for consumers of tradeable goods. An increase in the terms of trade will improve income and wealth, and lead to an expansion of expenditure. In time, the additional expenditure could add to inflation pressures, unless accommodated by an expansion of productive capacity or absorbed through imports to the extent that domestic productive capacity falls short. These "second round" pressures on inflation would be of most concern where the first round effects on the aggregate price level was in the same direction. Thus, a terms of trade increase arising from an increase in export prices would create greater inflation pressures than a terms of trade increase arising from a fall in import prices. Equally, a terms of trade fall resulting from an fall in export prices would create greater deflation pressures than a terms of trade reduction arising from an increase in import prices.

As noted at the outset of this article, the PTA states quite plainly that the main task of monetary policy is to prevent a spillover from a relative price shock to generalised, ongoing, inflation. Terms of trade movements arising from export price changes are likely, though their indirect income and expenditure effects, to create greater problems for the control of generalised inflation pressures than are terms of trade movements arising from import price changes. Thus, for both the real exchange rate adjustment
reasons set out in the table above, and generalised inflation control reasons, it would appear that terms of trade changes associated with export price changes might not sensibly be accommodated through the use of a PTA caveat.

The Policy Targets Agreement and the terms of trade caveat

In view of the foregoing (highly simplified) discussion, it would seem reasonable to recast the PTA caveat covering the terms of trade to refer to significant import price shocks alone. Export price changes would seem unlikely to warrant monetary policy accommodation. However, such a conclusion would be premature.

For a start, where movements in export prices that impact significantly on the aggregate price level are likely to be temporary, it might be sensible to allow the relative price change to impact on overall prices. No generalised inflation process is involved; nor is there a lasting income change, and therefore it is unlikely that there will be a significant expenditure effect that might later generate inflation pressures.

Secondly, it is very difficult to detect whether a relative price change will be lasting or transitory. It is not, therefore, easy or sensible to write down a binding set of rules on how to react to the array of types of terms of trade shock that might arise in the future.

And thirdly, even though the direction of movement of the nominal exchange rate consistent with real exchange equilibrium and price stability might typically be identical in circumstances of a permanent export price shock, the extent of the movement might not simultaneously square well with both interests.

For these reasons, the PTA refers to the terms of trade rather than import prices alone, and is written so as to be permissive rather than mandatory when it comes to the issue of whether a caveat should or should not be invoked. The permissive approach allows judgement to be brought to bear. Clear accountability for performance in relation to ongoing inflation both provides boundaries to the exercise of judgement, and predisposes the monetary policy reaction to being one that carries the least risk to maintenance of price stability.

Summary and conclusion

Recognising the tradeoff between costs of forced relative price adjustment and the gains to credibility from a tightly specified target, the Policy Targets Agreement that sets the 0 to 2 percent target range also includes clauses that contain caveats to the target. These caveats provide for circumstances in which large relative price shocks could be allowed to impact on the aggregate price level, but within an overall framework that makes prevention of ongoing inflation and deflation the overriding concern.

One caveat deals with relative price shocks reflected in changes in the terms of trade caused by movements in the world price of exports and imports. Analysis, set out in this article, shows that there are some circumstances in which the terms of trade caveat might not sensibly be invoked. In particular, export price shocks can lead to developments in incomes, expenditure, and the nominal exchange rate that are at the same time consistent
with desirable real sector adjustment and with maintenance of price stability. Additionally, invoking the terms of trade caveat in response to some export price shocks might add to subsequent inflation or deflation pressures, which, as noted, are the overriding concern.

However, it is not the case that all significant export price changes ought be prevented from impacting on the aggregate price level. Hence the specification of the PTA caveat dealing with the terms of trade covers export price shocks as well as import price shocks, but the application of the caveat is a matter for the Reserve Bank’s judgement, depending on the circumstances at the time.