Changes in the inflation process in New Zealand

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This article is a revised version of a paper prepared for the Bank of International Settlements Central Bank Economists' meeting held in Basel in October 2005. The article describes changes in the inflation process in New Zealand over the past two decades. Over time, inflation seems to have become less responsive to its fundamental determinants, such as excess demand pressures in the economy or variations in the exchange rate than was previously the case. This is partly attributed to the reduction and 'anchoring' of inflation expectations that followed the adoption of an inflation targeting framework. Some of the determinants of inflation have also changed in profound ways. Low global inflation and downward pressure on prices from countries such as China has muted New Zealand's inflation rate in recent years. The article notes that wages no longer appear to be a direct driver of inflation in the manner seen in the 1970s and 1980s. Changes in the competitive environment in New Zealand – especially in areas such as retailing – are also considered to have dampened the economy's 'inflation response', although there has so far been relatively little empirical work in New Zealand on this topic.

1 Introduction

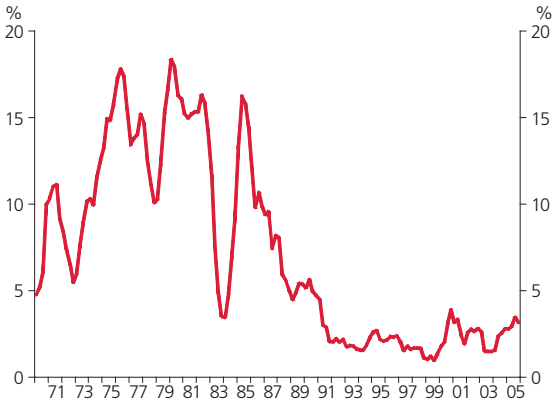
During the 1970s and the first half of the 1980s, New Zealand experienced high and variable inflation. In the second half of the 1980s, monetary policy embarked on a process of disinflation. The passage of the Reserve Bank Act (1989) saw the introduction of a formal inflation targeting regime, and by 1992 the underlying annual rate of CPI inflation was reduced to below 2 per cent. Despite some variability in the inflation rate since that time, and changes to the inflation target, inflation has been maintained at low single digit rates (see figure 1).[1]

When the Reserve Bank first began to target inflation, its understanding of the inflation process was based on a period in which inflation had been high and relatively variable.

Figure 1

Consumer price inflation[2]

(at annual rate)



Inflation has been maintained at low rates over the past 14 years, but it has also become considerably more stable.[3] At one level, this is hardly surprising – monetary policy has after all been actively pursuing low and stable inflation and

[1] Since 1992, there have been some changes to the Policy Targets Agreement (PTA), which is an agreement between the Reserve Bank and the Minister of Finance (required under the Reserve Bank Act (1989)). The PTA sets out the inflation target for monetary policy. Between 1992 and 1996, the Reserve Bank was required under the Policy Targets Agreement (PTA) to keep inflation within a 0 to 2 per cent range. The Bank did so over most of that period, although a build-up in inflation pressures due to a strong economy saw inflation rise briefly above 2 per cent in both 1995 and 1996. In 1996, the PTA was changed to 0 to 3 per cent annual increases in the CPI. Inflation was kept within the 0 to 3 per cent target until 2000, at which time pressures from a depreciating exchange rate and indirect tax changes led to a temporary spike in inflation. From September 2002, a new PTA has required the Reserve Bank to pursue 1 to 3 per cent inflation, "on average over the medium term".

[2] The measure of consumer price inflation shown here excludes mortgage interest rates, which were included in the headline CPI until 1999. It also excludes the effects of the introduction of a 10 per cent Goods and Services Tax (GST) in October 1986 and its subsequent increase to 12$^1/_2$ per cent in July 1989.

[3] In economic parlance, inflation is often said to have become less persistent, meaning that it has less tendency to continue moving up (or down) in response to a shock of some kind. There is a growing body of literature around the measurement of inflation persistence (see, for example, Cecchetti and Debelle (2004)). Note, however, that changes in the shocks that affect inflation may also play a role in muting the inflation process, even if the degree of persistence to a given shock has not changed.

inflation expectations have evolved to reflect this. However, the response of inflation to its immediate determinants also appears to have changed over this period. The sensitivity of inflation to excess demand conditions in the economy, fluctuations in the exchange rate, wages, or prices of key commodities such as oil seems to have reduced (see box 1).

Of course, this is not to suggest that inflation has been dormant in the New Zealand economy and unaffected by the various factors that we would expect to influence it. Over the past few years, monetary policy has had to respond to a significant increase in inflation pressures associated with very strong demand in the economy. However, at the margin, the economy's 'inflation response' appears to have been more muted than in the past.

Policymakers in many countries across the globe have also been favourably surprised at the subdued nature of the inflation process over the past decade (see, for example, Bean (2005)). Much effort is being directed towards understanding how the inflation process might have changed. Is it simply a consequence of successful inflation targeting acting to stabilise inflation expectations among households and firms, thereby making inflation less sensitive to shocks of various kinds? Are structural changes in economies contributing to this moderation? What role has productivity played? Are increased competitive forces playing a role? Are policies other than monetary policy playing a part? Is the availability of low-cost manufactured imports from countries such as China acting to mute the inflation process across the globe?

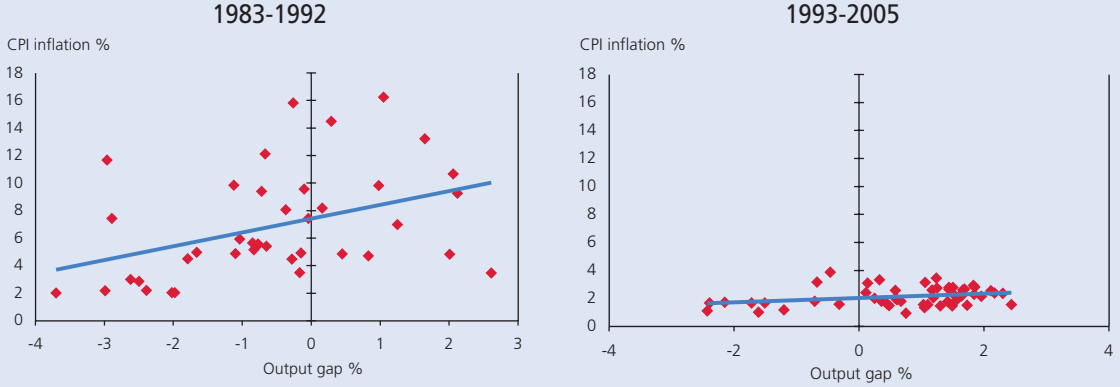
Box 1

The changing sensitivity of inflation to the economic cycle

A sense that inflation has become more muted to excess demand conditions in the economy over the past decade or so can be seen in figure 2. The two scatter plots relate annual CPI inflation to a measure of excess demand or supply in the economy (known as the output gap). The first plot is for the period preceding the achievement of low inflation and covers the years 1983 to 1992. The second plot covers the period since the achievement of low inflation.[5] A line of best fit is shown on each chart. This line, or 'Phillips Curve', has not only shifted down in the past 13 years (which would be expected given the reduction in inflation), it has also become more shallowly sloped. In other words, not only has inflation declined, it appears to have become less variable over the course of the economic cycle.

Figure 2

New Zealand's inflation-output relationship[4]



[4] The measure of CPI inflation shown here excludes mortgage interest rates and GST.

[5] Despite signs that the New Zealand economy's inflation response has become more muted, note that in recent years the Reserve Bank has tended to under-forecast inflation (see Ranchhod and McCaw, 2002). However, the main reasons for under-predicting inflation appear to be a misreading of the exchange rate cycle and strength of demand pressures, rather than an overly-optimistic reading of the inflation process.

These are among the questions that have been receiving attention.

The purpose of this article is to summarise some of the important ways in which the inflation process appears to have changed in New Zealand over the past 15 years. Some of these areas have been subject to empirical examination, whereas others remain the subject of conjecture and ongoing research within the Reserve Bank.

The five key areas examined in this article include:

- The changing behaviour of inflation expectations;
- the more muted response of prices to exchange rate fluctuations;
- globalisation, low trading partner inflation and greater flexibility in trade patterns, which have led to reductions in imported inflation;
- the apparent breakdown of the traditional wage and cost-dynamic in the inflation process; and
- heightened competition in the economy generally and in retailing in particular, which appears to have played a more persistent role in containing price increases than we might have expected.

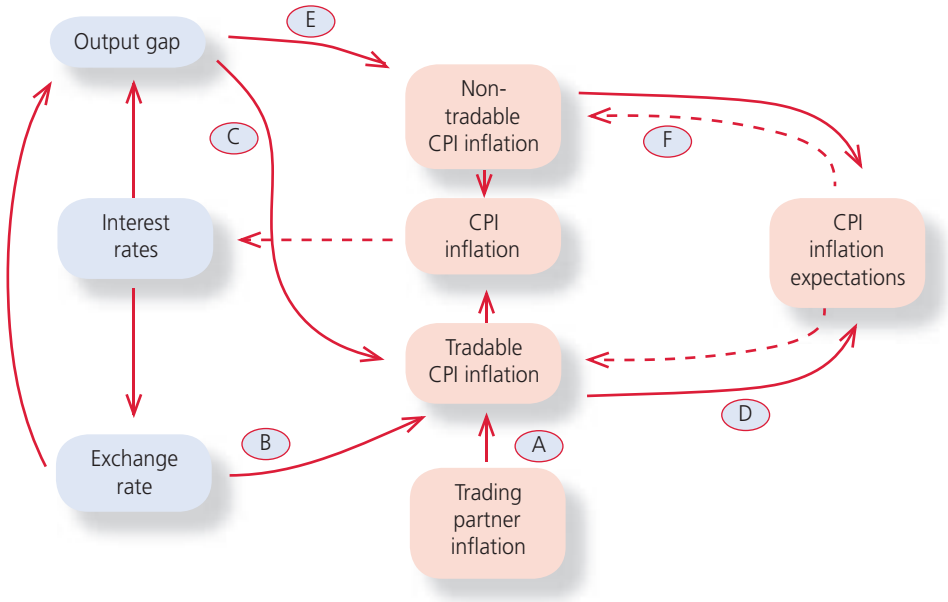
Section 2 of the article briefly provides a stylised model of inflation against which these changes can be discussed. Section 3 goes on to discuss the various changes to the inflation process, while section 4 concludes.

2 The inflation process

Before discussing ways in which the inflation process may have changed, it may be useful to set out, in broad terms, a stylised model of the inflation process in New Zealand. Changes in the inflation process can then be discussed in light of the various channels identified in the model. Of course, there is no one 'right' model of inflation, and observed inflation outcomes may be consistent with a range of different models. However, it is still useful to have a framework in mind when discussing the inflation process.

Figure 3 provides a stylised diagram that broadly represents the way the Bank currently models the inflation process in New Zealand. CPI inflation is explained in terms of its two key components – tradables and non-tradables. Tradables covers goods and services which are imported from overseas and/or for which there is significant international competition. The non-tradable component covers items subject to little international competition and is largely made up of construction- and housing-related costs, some utilities like electricity, and services.

Figure 3
A stylised representation of the inflation process in New Zealand



As shown by the diagram, the main proximate determinants of tradables inflation are thought to be the rate of trading partner inflation (A) and movements in the exchange rate (B). This captures the fact that tradables inflation may be largely 'imported' given that New Zealand is generally a price-taker in world markets. Excess demand or supply conditions in the domestic economy may also have a bearing on the level of tradables inflation (C), with excess demand conditions resulting in stronger rates of tradables inflation. There are potentially a number of channels through which excess demand conditions may operate, including via their effect on the local production and distribution costs of tradables, and on the level of margins able to be earned in product markets. Finally, the level of inflation expectations is also thought to influence the level of tradables inflation, with higher rates of tradables inflation, in turn, likely to have a feedback effect on the level of inflation expectations (D). This 'expectations effect' may likewise operate through a variety of channels, such as through wage claims or price-setting behaviour.

The main determinants of non-tradables inflation are thought to be excess demand or supply conditions in the domestic economy (E) and inflation expectations (F) (again through a mutually reinforcing relationship). Some work has recently been undertaken at the Bank to clarify this relationship further and this is reported in Box 2. The work has highlighted the dominant influence of housing-related prices in establishing the relationship between excess demand conditions and non-tradables inflation in New Zealand.

The left side of the diagram captures the role of interest rates in influencing the level of demand and the exchange rate, thereby exerting an influence on both tradables and non-tradables inflation and, indirectly, in the level of inflation expectations. These two channels reflect the ways in which changes in the Official Cash Rate (OCR) may ultimately affect inflation.

The stylised inflation model shown in figure 3 differs from models of the inflation process that characterised the Bank's understanding of the inflation process up until the mid 1990s (see, for example Schoefisch, 1993). These earlier models, which could loosely be characterised as 'cost-push' or 'mark-up' models, principally modelled inflation as a function of the costs of production, such as unit labour costs and import prices. Such models stressed the role of changes in production costs, such as wages, in directly influencing inflation and had little explicit role for inflation expectations. While the model in figure 3 is not necessarily inconsistent with 'cost-push' influences on inflation, it potentially allows for a rather broader range of influences.

The diagram in figure 3 is stylised and does not purport to capture every possible influence on inflation. There are a host of factors – such as indirect tax changes, changes in the intensity of competition, technological changes and so on – which may have an important bearing on inflation outcomes but are not represented on the diagram.

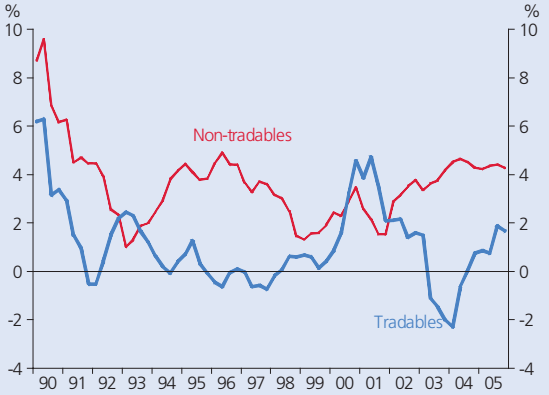
Box 2

Non-tradables inflation in New Zealand

Figure 4

Tradables and non-tradables inflation

(at annual rate)



As shown in figure 4, non-tradables inflation has significantly outpaced tradables inflation, on average, over the past 15 years, a divergence evident in most open economies. Fluctuations in tradables inflation are largely a reflection of exchange rate movements, whereas fluctuations in the non-tradables component are more likely to be due to 'domestic' influences. Work has recently been undertaken at the Reserve Bank to better understand the behaviour of non-tradables inflation.

(continued on p 22)

Figure 5

Non-tradables inflation and the output gap

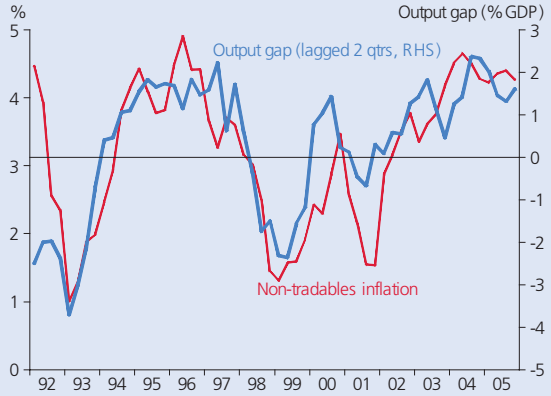
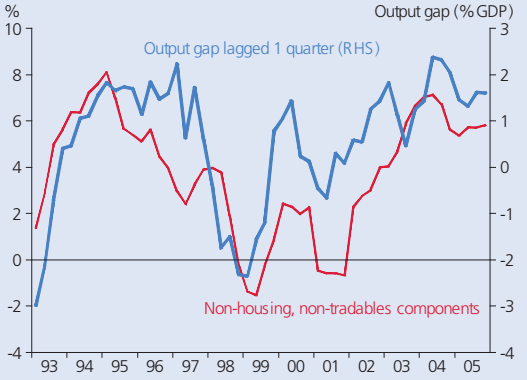


Figure 6

Housing-related inflation and the output gap



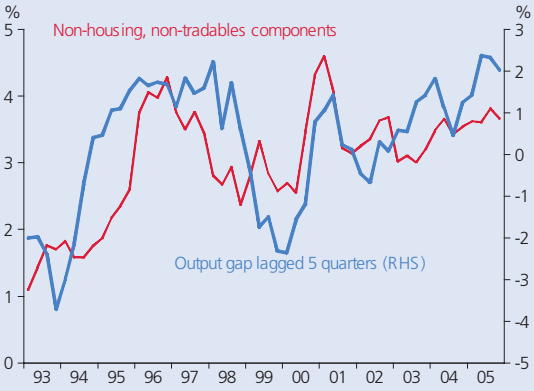
As shown by figure 5, there has been a relatively tight relationship in New Zealand between non-tradables inflation and cyclical indicators such as the output gap over the past 15 years, perhaps to a greater extent than in some other countries.[6]

Kite (2005a) found that the cyclical relationship with non-tradables largely arises due to the housing cycle, which has tended to be a dominant feature of economic cycles in New Zealand (figure 6). A number of housing -elated prices included in the non-tradables index appear to be particularly closely correlated with the economic cycle, including construction costs and rentals.

However, Kite's work has also revealed that the non-housing components of non-tradables inflation have also displayed an enduring relationship to the economic cycle over recent years, albeit with a rather longer lag (figure 7). While this secondary cycle in non-tradables inflation is more muted than for the housing components, there is also little compelling evidence that it has changed appreciably over the past 15 years.

Figure 7

The non-housing component of non-tradables inflation and the output gap



Of course, the fact that this aggregate relationship between non-tradables inflation and the cycle seems to have stabilised over the past 15 years does not necessarily preclude ongoing changes to the inflation process at a more disaggregated level (ie, in particular industries within the non-tradables sector). Work in this area is continuing.

[6] This relationship is perhaps all the more surprising given that non-tradables inflation includes a number of local and central government administered prices. When these items are excluded, the relationship further improves.

3 Ways in which the inflation process has changed

Inflation expectations

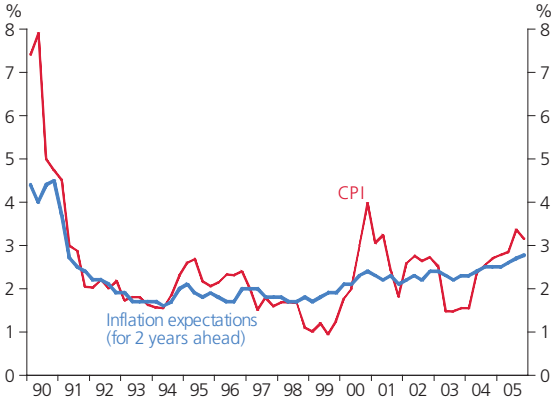
As figure 3 illustrates (see channels D and F), inflation expectations play a central role in determining inflation outcomes. The adoption of inflation targeting explicitly recognised this role and the reduction in the 'sacrifice ratio' that can be achieved by building credibility in a low inflation target.

Survey measures of inflation expectations gradually began to fall during the process of disinflation (figure 8), although much less quickly than inflation itself. By the early 1990s, some measures of expectations had settled at a little below 2 per cent, seemingly consistent with the inflation target of the time.[7] Surveyed expectations have edged up slightly over

the past 9 years. In part, this probably reflects the change to the inflation target in 1996 (from 0 to 2 per cent to 0 to 3 per cent) and again in 2002 (when a target of 1 to 3 per cent inflation on average over the medium term was adopted).

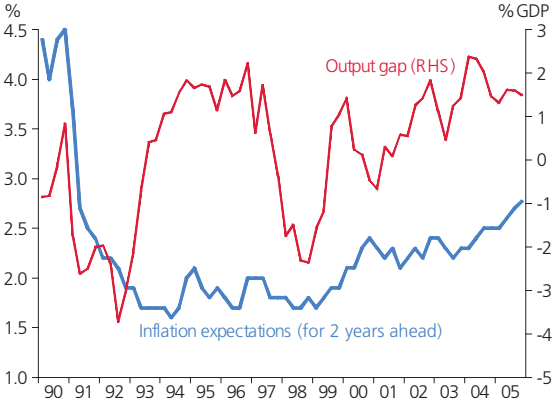
As time progresses, we have become more confident in New Zealand that inflation expectations have become more stable and target-consistent. As noted, New Zealand's Phillips curve appears to have flattened and become rather better 'anchored' over the past 15 years than was the case over the high inflation period of the 1980s. Surveyed expectations have remained relatively stable during the recent economic cycle (figure 9). Expectations appear to have been less prone to inflationary shocks (such as that generated by the sharp exchange rate depreciation in 2000) than we may have feared.[8] This seems to have made the task of countering a pick-up in inflation associated with the economic cycle a little easier than might have been the case if expectations had been more responsive to a lift in inflation. However, we have also been extremely wary of simply assuming that inflation expectations are 'anchored' and taking policy risks based on that assumption.

Figure 8
Inflation and surveyed inflation expectations
(at annual rate)



Alas, the empirical evidence around the inflation expectations process in New Zealand remains very blurred. One of the side effects of successfully achieving low and stable inflation is that the expectations data also tend to become low and stable and hence less empirically 'revealing'. There has been some empirical work, such as that provided by Basdevant (2003), suggesting that inflation expectations are becoming less responsive to lagged inflation and the output gap, and potentially more 'rational'. However, Basdevant cautioned that the available data series is short and the approach used may be too simple to capture all aspects of the inflation process.

Figure 9
Surveyed inflation expectations and the output gap



Hunter (2005) has also looked at the structure of the expectations formation process and concluded that empirical analysis is hard-pressed to gauge the extent to which inflation expectations are being formed adaptively (with reference to historical inflation), or with reference to the inflation target (which would reveal something about the credibility of monetary policy), or some other forward-looking process. The expectations data for New Zealand over the past 15 years can be equally well described by models with a large 'backward' component as they can by putting a large weight on a 'forward' looking component, or the inflation target.

[7] In New Zealand, there are several surveys of inflation expectations. Surveys of the household sector generally reveal expectations well in excess of actual inflation. Expectations derived from the Reserve Bank's Survey of Expectations (shown in figure 8) covers mainly business sector respondents and tracks closer to actual inflation. Ranchhod (2003) provides further discussion of the various expectations series in New Zealand and their pitfalls.

[8] Given New Zealand's open economy, with considerable participation by foreign firms, we are also conscious that low inflation abroad may have assisted in keeping expectations low in New Zealand over recent years.

From a policy perspective, we know that a reduction in inflation expectations has been very helpful in maintaining low inflation in New Zealand over the past decade. But what we really want to know is how that process could change endogenously over time (eg, in response to a significant inflationary shock or policy error). Despite our confidence that expectations have probably become more stable, and less prone to being disturbed by temporary perturbations to inflation, we are still some way from showing that empirically. Nor are we in a position to reliably gauge how inflation expectations might be affected by a future inflation shock.

Exchange rate pass-through

Exchange rate movements can have a direct bearing on CPI inflation through their effect on the price of tradables (see channel B in figure 3).[9] Prior to the float of the NZ dollar in 1985, New Zealand had regularly depreciated its exchange rate as the effects of easy monetary policy led to high inflation, a continued loss of competitiveness in the traded goods sector, and burgeoning current account deficits. In this environment, any depreciation of the exchange rate was widely (and correctly) regarded as permanent. As a result, the degree of pass-through from exchange rate changes to inflation tended to be high.

Research conducted in the late 1980s and early 1990s – which largely encapsulated this pre-float period – commonly put the exchange rate pass-through coefficient to the CPI at between 0.25 and 0.35 percentage points for a 1 percentage point fall in the trade-weighted exchange rate. With the overall import content of the CPI estimated to be about 20 per cent at that stage, these findings suggested not only complete exchange rate pass-through to prices, but also a lot of second round spill-over into inflation expectations. The speed of price adjustment was found to be rapid, with much of it occurring within 2 to 3 quarters.

As reported in Hodgetts and Clements (1989), the strong relationship between exchange rate movements and prices played an instrumental role in reducing inflation during the disinflation period of the late 1980s. A sharp rise in the New Zealand dollar between 1985 and 1988 contributed to a marked fall in inflation over that period.

During the 1990s, the Reserve Bank found that the exchange rate influence on consumer prices was becoming significantly more muted. Estimates of a small fall in exchange rate pass-through are reported by Corfield (1996), among others.

Hampton (2001a) estimates that the long-run pass-through coefficient dropped to about 0.15 for the period covering the 1990s, lower than earlier estimates. Hampton reported that Stage 1 pass-through – the impact of the exchange rate changes on import prices at the docks – had remained nearly 1 for 1 in New Zealand over the years. He attributed the reduction in exchange rate pass-through to a decline in Stage 2 pass-through – ie, from import prices to consumer prices.

Recent (unpublished) updates of the coefficient, which take into account the latest exchange rate cycle, point to a long-run coefficient of about 0.20 – broadly similar to Hampton's. This work has produced a coefficient of about 0.10 applying a year out from the exchange rate movement. These updates have confirmed Hampton's earlier finding of a high degree of Stage 1 pass-through (see figures 10 and 11).[10]

Both Hampton's work and more recent estimates confirm that the actual observed degree of exchange rate pass-through in the short run (ie, for periods out about 1 year) depends on the economic cycle. All things equal, a positive output gap leads to relatively more upward pressure on prices in response to an exchange rate depreciation. Given that consumer prices for tradables will partly be determined by the internal distribution sector (freight, storage, retail margins etc), this finding is to be expected.

[9] The exchange rate will also have an indirect bearing on inflation through its effect on economic activity. Changes in the influence of the exchange rate on activity are not considered further in this article.

[10] A recent cross-country study detected a more muted pass-through from the exchange rate to import prices for New Zealand (see Campa and Goldberg, 2005). However, this study was conducted using an extended sample period from 1975 to 2003 and may not be directly comparable. Moreover, the study did not directly investigate changes in exchange rate pass-through to import prices for New Zealand over time.

Figure 10

New Zealand tends to see complete 'stage 1' exchange rate pass-through

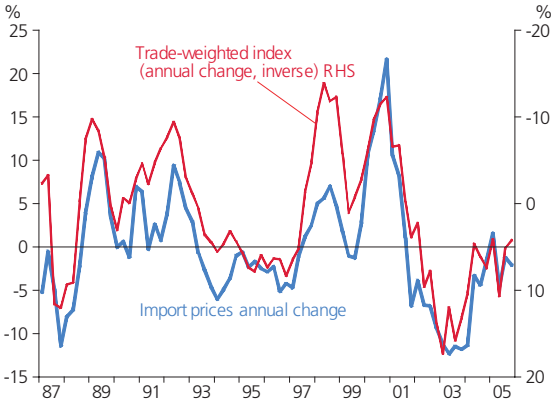
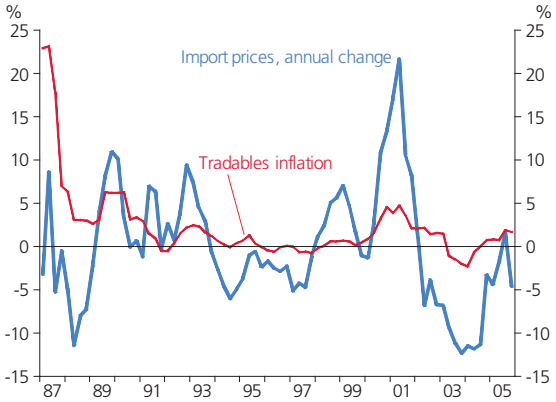


Figure 11

Pass-through from import prices to consumer prices has become muted



Over the years, a wide range of reasons have been advanced to explain the reduction in pass-through, although there has been little formal empirical verification of the competing theories. In a floating exchange rate environment, if businesses consider exchange rate fluctuations as temporary, they may well choose to absorb exchange rate -related changes in costs in margins, rather than risk losing market share by moving prices. This would certainly help to explain the lengthening of the time it takes for exchange rate changes to pass-through into prices. To the extent low inflation has resulted in a better anchoring of exchange rate expectations, it may also have resulted in more subdued second round effects from changes in import costs (which may have inflated early estimates of pass-through).

The predominance of pricing to market or price smoothing strategies on the part of international suppliers and/or their local subsidiaries may have increased. For New Zealand there is some evidence of this behaviour in the motor vehicle sector since the mid-1990s, with consumer prices for new cars remaining surprisingly stable despite considerable exchange rate movements. Discussions with the motor vehicle industry have tended to confirm this type of behaviour.

The increased use of exchange hedging by importers has also been advanced as a possible reason for more muted pass-through. This may be true at the margin. Briggs (2004) reports a study of hedging activity on the part of New Zealand's exporters and importers. Feedback by financial institutions providing hedging products pointed to an increase in hedging activity since the early 1990s. However, Briggs found that the degree of exchange rate hedging on the part of importers was relatively low (certainly in comparison to that undertaken by exporters), and where it does occur is usually for very short terms (periods of six months or less).

Globalisation, changing trade patterns, and the 'China effect'

Along with the exchange rate, changes in the foreign currency prices of imports have an important influence on the tradables component of the CPI (channel A, figure 3). For New Zealand, there are strong grounds to suggest that low trading partner inflation and the availability of lower cost imports from countries such as China have provided a powerful dampening influence on the tradables component of inflation. An examination of the CPI shows that the retail prices for some household goods, such as electrical appliances, have declined substantially over the past 15 years, while prices for some other items, such as clothing, have shown only very modest price increases over a sustained period (figure 12).

Although, as noted later in this article, 'domestic' factors may partly account for declining prices (or very weak price increases), falling import prices appear to be a key

Figure 12

Prices for selected tradable items in the CPI

(1990q1=100)

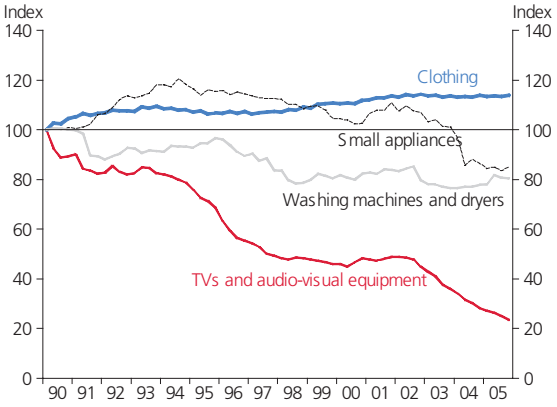
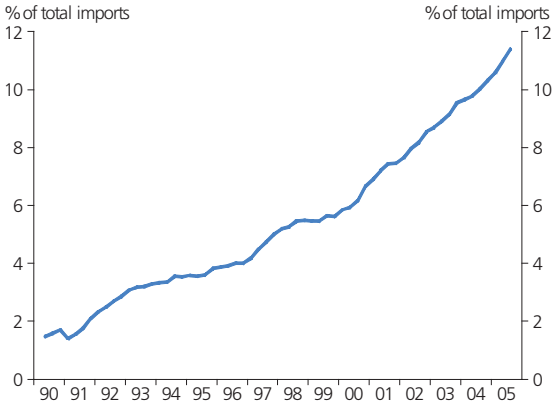


Figure 13

Imports from China as a share of total imports



influence.[11] Globally, a switch to low-cost production centres in China and elsewhere has clearly played a part in driving world prices lower as have technological advances and product life cycle effects. Since 1997, the estimated foreign currency price of imported manufactures has fallen by an average of about $2^1/_2$ per cent per annum. Up until 1996, positive rates of foreign currency inflation for manufactured goods had generally been experienced. Since then, an outright fall in foreign currency import prices has been evident for both finished and intermediate goods. The reduction in intermediate goods prices will have helped to contain production costs for local manufacturers.

Although a lack of country-specific import price data has hindered formal empirical analysis, changing trade shares are consistent with an ongoing switch to lower cost international suppliers. As figure 13 illustrates, New Zealand's (direct) import share from China has virtually doubled in the past 5 years (now standing at around 11 per cent of total imports). This switch in trade flows will have accentuated the reduction in import prices.

In the Reserve Bank's regular discussions with the business sector, manufacturers, wholesalers and retailers and others involved in importing have confirmed an ongoing switch toward lower cost suppliers such as China. Some businesses appear to have had a strategy of pursuing such products far more actively than in the past. In many cases, businesses have confirmed that these imports have displaced products sourced from traditional foreign suppliers, or produced locally. Many manufacturers also report an increased use of components sourced from Asia as a means of containing the costs of production of their own products and/or to help them compete with cheaper imports.

Changes in the wage-price relationship

As noted in section 2, the traditional approach to modelling inflation in New Zealand was to assume prices were set as a reasonably stable mark-up over the core costs of production – import prices, wages and labour productivity.

Underlying this approach were three key assumptions:

- that changes in import prices and unit labour costs tend to 'cause' prices rather than the reverse;
- that the coefficients on the import price and unit labour cost terms were relatively stable; and
- that the mark-up on costs was either fixed, or relatively 'predictable' (cycling with the strength of the economy).

Gradually, the cost plus model of inflation appears to have become less relevant for New Zealand. The reduction in exchange rate pass-through was discussed earlier. And while wage inflation had significant predictive power for inflation during the 1970s and 1980s, this relationship appears to have changed markedly over the 1990s.

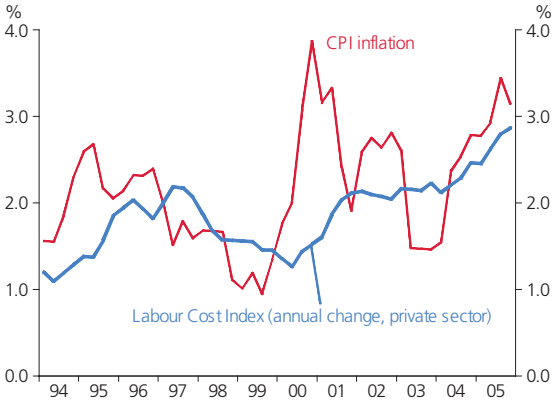
[11] Note that declines in the prices for some of these items, at least in the earlier half of the 1990s can also be attributed to the ongoing reduction in import tariffs

Hampton (2001b) provides evidence showing that although wages 'led' prices in the 1980s, the relationship reversed over the 1990s, with wage movements tending to follow inflation rather than the reverse. A pick-up in wage inflation is no longer seen as indicating an acceleration of CPI inflation pressures in the same way it might have in the 1980s. As shown in figure 14, wage settlements adjusted for labour productivity were often lower than actual inflation over much of the last decade, and rarely exceeded it significantly. This was often not the case in the 1970s and 1980s.

Labour market reforms in the early 1990s reinforced the trend toward a more decentralised (firm- and site-specific) wage bargaining system, displacing the centralised wage-bargaining system that had been in place during the 1970s and early 1980s. Increasingly, we have moved to a system where wages are set to reflect the underlying conditions of individual industries and firms, rather than an arbitrary 'claim' factor applying across a range of industries.[12]

Figure 14

Private sector wage inflation and CPI inflation



There has also been a been a decisive shift to longer-term wage agreements (eg, contracts spanning 2- or 3-year periods), no doubt partly encouraged by the lower inflation environment and more stable inflation expectations.[13] Longer contract lengths reduce the likelihood that temporary inflationary disturbances get passed into wages. Of course, they also raise the possibility that when wage inflation does increase, it is slower to adjust downwards again.

In recent years, against the background of a very tight labour market in New Zealand, there has been some evidence that firms have provided non-pecuniary benefits (such as training) in lieu of more aggressive wage increases as a means of attracting and rewarding staff. To the extent that this practice avoids the cost-ratcheting effect associated with larger wage increases, it may also reduce pressure on cost structures over the economic cycle. The increasing tendency for firms to use labour from overseas to help meet shortages may also have acted as a 'safety valve' for wage increases, although little research has been done to evaluate this effect.

The net effect of these sorts of changes has been to weaken the previously tight linkage between wages and CPI inflation. Wage inflation still accelerates following periods of labour market tightness, but less dramatically and with a somewhat longer lag than was previously the case. Helpful as this has been to containing inflation pressures during periods of strong economic activity, as policymakers, we have remained wary of the potential for wage inflation to re-assert itself as a direct driver of inflation.

Increased competition and other structural changes

A further factor undermining the cost-push model of inflation and muting inflationary pressures in some parts of the New Zealand economy over the past 15 or so years has been heightened competition. A myriad of factors have contributed to more intense competition:

- The opening up of the economy in the late 1980s, which saw the removal of import protection and other barriers to the entry of foreign goods;
- various industry regulatory changes, directly aimed at fostering greater efficiency and competition and allowing new players into markets;
- structural changes within industries, including retailing, such as the arrival of large discount chains, mega-stores

[12] Blackwood et al (2005) report that, as of 2005, only 8 per cent of private sector employees were covered by a multi-employer agreement.

[13] Blackwood et al (op cit) note that of collective wage agreements struck during the year to June 2005, 76 per cent were for terms in excess of 12 months. This was up from 65 per cent in 1996.

and international conglomerates with greater buying power and scale economies.

Mourougane and Wise (2005) conclude that New Zealand markets are now well exposed to competition, although they highlight several areas where competition could be further enhanced. Using data for 1997–2002, they find that New Zealand's price level is relatively low by international standards, consistent with strong competition (but possibly with many other factors too). They also find low barriers to trade and very high entry and exit rates in the New Zealand business sector. However, the authors do not attempt to quantify the effects of competition on inflation.

The Bank's own analysis of inflation outcomes confirms that the move to greater competition has had a material impact on pricing in a number of sectors such as air travel and utilities. For instance, international and domestic calling charges steadily declined by around 80 per cent between 1987 and 1999. To be sure, this was not purely 'competition' at work – technology also partly explains the decline. But competition certainly helped. This decline in calling charges shaved something in the order of 0.2 percentage points (on average) from each year's CPI inflation rate over this 12 year period.

Over the past 3 years, international airfares for New Zealand consumers have declined by around 30 per cent, primarily due to the entry of new market players on the important trans-Tasman route. This again has shaved something in the order of 0.2 percentage points from each year's CPI.

These (and other) downward adjustments in prices have been more prolonged than we expected and, in aggregate, have materially dampened CPI outcomes over the past 15 years. But the bigger question is the extent to which greater competition has had a permanent effect on the inflation process. There have been some cross-country studies such as Neiss (2001) and Cavelaars (2002), suggesting that increased competition can contribute to a structurally lower level of inflation. There have been no New Zealand specific studies, but as policymakers, we strongly suspect that competition has contributed to a more muted inflation environment.

Mourougane and Wise (*op cit*) conclude that New Zealand's retail sector is one of the most liberal in the OECD, with few restrictions on market entry. Consistent with that finding, recent work at the Bank has highlighted the extent to which structural changes in the retail sector may be acting to dampen price inflation. Kite (2005b) reports a sizeable expansion in both the number and average size of retail stores operating in New Zealand over the past 5 years. Kite notes that this expansion in retail infrastructure (relative to sales) appears to have constrained the sector's profitability, citing only a small rise in margins and very low rates of inflation in many parts of the retail sector. This is despite sustained, strong growth in retail sales over the same period. More sales have been spread over a larger pool of outlets.

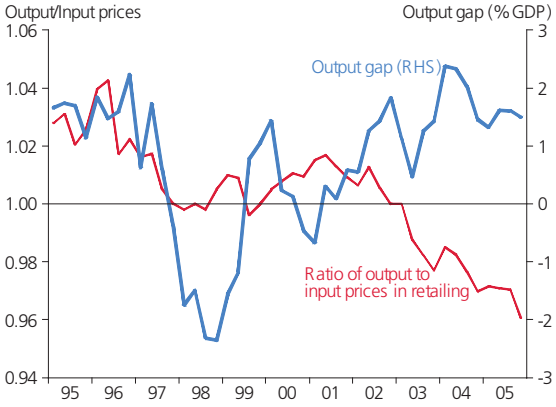
In explaining the shift toward larger stores, which has occurred in areas such as supermarkets, department stores, hardware, footwear and appliances, Kite notes that many retail operators have been pursuing competitive advantages in the form of greater buying power from local and overseas suppliers as well as other scale economies. Much of the expansion in capacity has been by companies with a wider international presence, providing them with further leverage in this regard. Although Kite's study covers only the period from 1999 to 2004, such changes appear to have been ongoing over a much longer period and may therefore have contributed to changes in the observed inflation 'process'.

It seems likely that changes in New Zealand's retail sector over the past decade mirror what some US economists, such as Robert Solow, have labelled the "Wal-Mart phenomenon". According to Solow (2001), a combination of technology, the large store format and improved logistics in areas such as warehousing, shipping and picking enabled Wal-Mart in the US to open up a large productivity gap over other retailers. This, in turn, meant Wal-Mart could offer substantially lower prices than its competitors. The rest of the industry has been forced to imitate Wal-Mart in order to survive.

The influence of the "Wal-Mart phenomenon" on inflation in New Zealand has yet to be empirically determined, but there is a strong suspicion that structural changes in the retail sector have assisted in dampening CPI inflation pressures (more than 60 per cent of the CPI is made up of retail prices). There is some evidence of a secular decline in

Figure 15

Ratio of retail sector output prices to input prices[14]



output prices relative to input prices in New Zealand's retail sector, notwithstanding variations across the economic cycle (figure 15). Of course, changes in retailers' buying power and supply networks may also help to explain the observed reduction in exchange rate pass-through to prices as well as the rapid rise in imports from cheaper non-traditional sources, such as China, noted earlier.

4 Conclusion

This article has briefly explored some of the changes in the inflation process in New Zealand over the past 15 or so years. It noted that the economy's inflation response to various factors such as demand conditions or the exchange rate appears to have become more muted since the introduction of inflation targeting. A sharp reduction in inflation expectations that occurred following disinflation has played a major role in keeping inflation low over this period and is probably the single biggest change. In addition, the reduced influence of the exchange rate on prices, globalisation effects, a weakening in the relationship between wages and price inflation, and heightened competition all seem to have played a role in dampening the economy's inflationary response to shocks.

Understanding how the inflation process works and how it is evolving is crucial for the effective implementation of monetary policy. As this article has highlighted, there are many aspects of the inflation process that are ripe for further research. The Bank continues to devote much of its efforts into understanding how the various influences on inflation are changing, drawing on international analysis and insights where relevant.

[14] Note that input prices cover the purchase of merchandise and all other operating expenses other than wage costs. Output prices are selling prices excluding GST and other sales taxes. The omission of labour costs from input prices means that figure 13 must be interpreted with caution. For example, a low rate of increase in labour costs would imply that margins may not have declined to the extent that figure 15 suggests.

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