

CAUSES OF THE FALL IN INFLATION: 1985-88

In this article, Bernard Hodgetts and Robin Clements examine the factors that have contributed to the recent fall in inflation.

Executive Summary

Despite the significant progress made in reducing inflation since 1985, some debate remains as to the factors which have contributed to this decline. To estimate the extent to which domestic and external factors have contributed to reducing CPI inflation, some relationships have been developed to explain the inflationary process in New Zealand over the last decade. These relationships reveal that movements in import prices, unit labour costs and house prices provide a good degree of explanation of trends in inflation of the CPI. An historical breakdown of the various influences on CPI inflation since 1985 was then developed.

The principal finding of the analysis is that factors within the influence of domestic monetary policy, such as the exchange rate, have been chiefly responsible for the fall in inflation over the period.

Introduction

The inflation out-turn of 4 per cent for the year to March 1989 marked the lowest year-to-date increase in the Consumers Price Index (CPI) experienced in New Zealand since 1969.¹ But there is debate as to which factors made the strongest contribution to the fall in inflation over 1985-1988. Some commentators have asserted that much of the progress which has been made in reducing inflation in New Zealand over the past four years is attributable to factors unrelated to domestic monetary policy. Specifically, lower world inflation is credited with having made the largest contribution to the fall in inflation over 1985-88.²

This article presents some empirical evidence which, by statistically decomposing the direct (or proximate) determinants of inflation in New Zealand, enables the relative contributions of the various factors directly influencing CPI inflation to be assessed. One of these factors is foreign inflation. The article does

not attempt to draw conclusions about the absolute contribution of monetary policy to reducing inflation, since the degree of influence of monetary policy on the direct determinants of inflation is not examined. Thus the focus in this article is on the proximate, rather than the more fundamental, determinants of inflation.

To see this distinction, it is useful to refer to a diagram of the monetary policy transmission mechanism. Figure 1 presents a more detailed version of the diagram which appeared in the June 1987 *Bulletin*.³ By setting the level and composition of primary liquidity (i.e. settlement

cash and discountable Reserve Bank bills), monetary policy directly exerts pressure on the level of short-term wholesale interest rates. Thereafter, the effect on inflation occurs through a number of channels, such as through changes in the exchange rate, inflationary expectations and domestic demand. Rather than examine the full transmission of monetary policy from primary liquidity to inflation, the focus of this article is to examine only the contribution of those factors shown as proximate determinants of inflation (i.e. determinants with an arrow feeding directly into inflation).

The Inflationary Process

In order to make an estimate of the degree to which foreign prices and other factors have contributed to reducing CPI inflation, some empirical relationships have been developed which explain the inflationary process in terms of these variables of interest.

Three equations were estimated to achieve this aim. These equations examine the linkages between inflation in production costs (proxied by the Producers Price Index for inputs, PPI-I), 'factory gate' or wholesale prices (proxied by the Producers Price Index for outputs, PPI-O) and the CPI. The year-to-date inflation rate of each index since 1980 is presented in figure 2, which shows that each inflation rate has followed a

² For example, Jan Whitwell claims: "[The Reserve Bank's] disinflationary strategy has had, at best, only second-order effects on their ultimate policy objective - inflation ... What has caused the recent fall in the New Zealand inflation rate? The answer ... is lower world inflation" (in: 'Monetary Policy: An Anti-Inflationary or an Anti-Employment Strategy', paper presented to a Monetary Policy Seminar, Auckland, November 1988). Similarly, David Sheppard claims: "There is no compelling evidence to suggest that the RBNZ incomes and price policy as we choose to call it has been especially effective in conditioning the rate of inflation to date. At the very best, we assess the contribution to date as bordering on the trivial. Other factors, such as the convergence of the New Zealand rate of inflation to the world rate of inflation as tariff barriers have been cut, import licensing eradicated and the impact of the switch from direct and indirect taxation phased out, collectively probably account for most of the drop of our inflation rate from 18 per cent plus to a little over 5 per cent over the period" (in: 'The Conduct of New Zealand Monetary Policy and the Fortunes of the Traded Goods Industry: Some Suggested Changes', paper presented to a Monetary Policy Seminar, Auckland, November 1988).

³ See "A Layman's Guide to Monetary Policy in the New Zealand Context", Reserve Bank *Bulletin*, June 1987, p.107.

¹ With the exception of two quarters during the wage and price freeze period of the early 1980s.

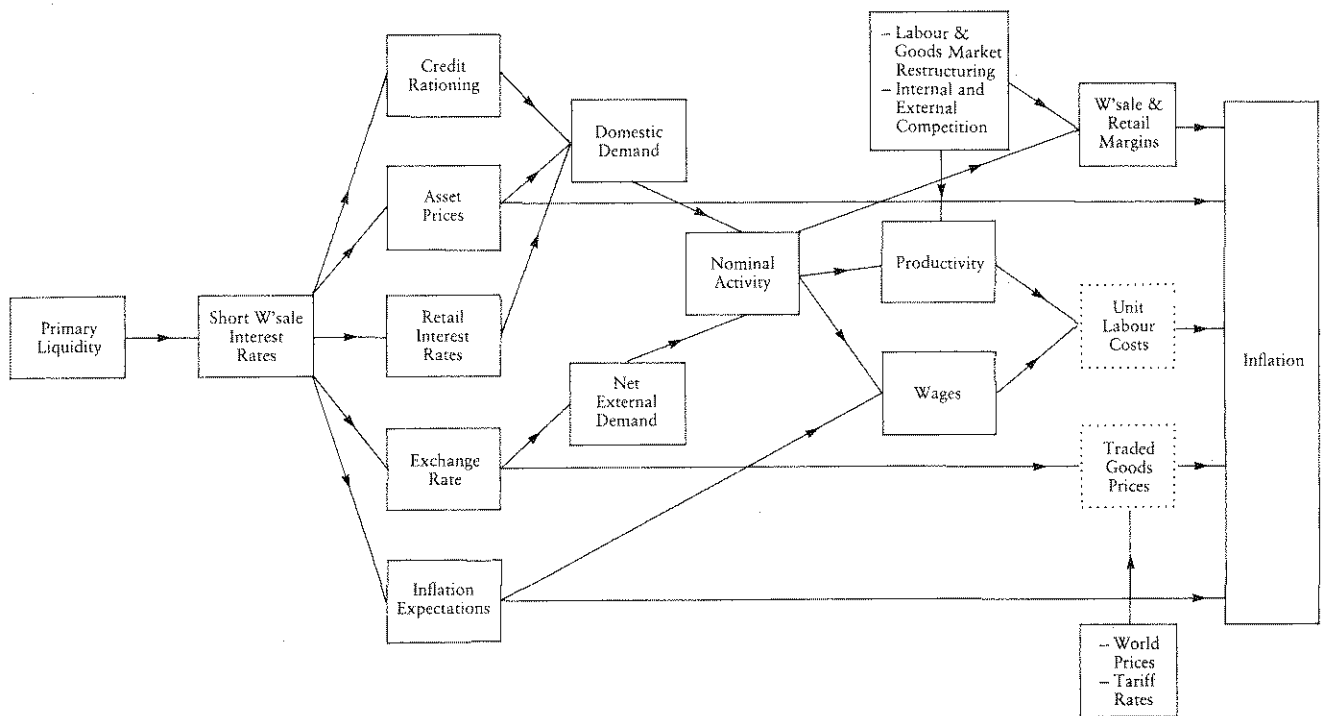
FIGURE 1

MONETARY POLICY TRANSMISSION MECHANISM

Operating Target

Intermediate Influences

Final Target



similar trend throughout the period – suggesting the presence of some relationship between the three measures of inflation – although short run divergences are also evident.

PPI Inputs Inflation

The approach used here to analyse CPI inflation identifies the basic or ‘core’ inflationary process as originating at the stage that inputs enter the productive process – these being measured by changes in the PPI-I. In this regard, the ‘core’ elements which affect the cost of inputs include import prices and the cost of labour (i.e. unit labour costs).⁴ Following this approach, import price and unit labour cost inflation terms were found to provide

a good degree of explanation of inflation in the PPI-I in New Zealand over the last decade (all inflation rates are expressed in year-to-date terms). The estimated weights are shown in table 1 and are interpreted as follows: a 1 per cent increase (decrease) in the inflation rate of unit labour costs has, historically, been associated with an increase (decrease) over time in the PPI-I inflation rate of an average 0.44 per cent – all other things being equal. The influence of a change in import price inflation is interpreted similarly.⁵

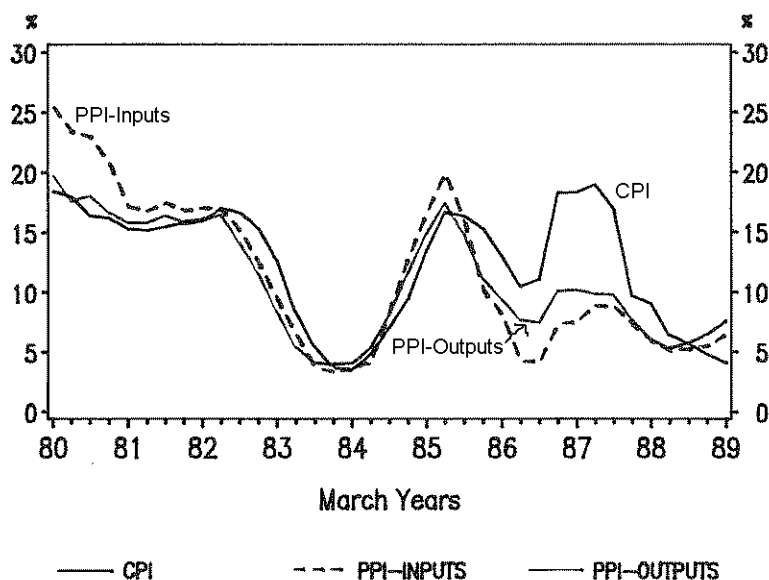
⁴ In terms of the PPI definitions, the inputs index does *not* include the direct labour costs of the business units surveyed; however, as all domestic material input costs include a labour cost component, labour costs are likely to be a major factor determining the inputs index.
⁵ Full estimation results for this and the other equations discussed in this article are available from the authors on request.

PPI Outputs Inflation

Having estimated the principal long-run influences on PPI-I inflation over the past decade, an empirical relationship between inflation in the PPI-I and inflation in the Producers Price Index for outputs (PPI-O) was then established on the hypothesis that inflation in the two indices can be expected to converge over the medium to longer run. The only exception to this hypothesis would be if there were some factors which were capable of accounting for differences between the two indices and which were themselves continuously changing.

The PPI-O is designed to capture the final sale, or factory, price set by business units. As such the PPI-O implicitly measures those prices covered by the PPI-I plus direct wage

Figure 2
Consumer and Producer Prices
Annual Percent Changes



flation rates between the PPI-I and PPI-O will only create a sustained gap in the inflation rates if these factors themselves are also changing continuously. For this reason, a significant divergence between the two inflation rates is unlikely to be sustained for long. Thus, one would expect to find a one-for-one relationship between input and output price inflation over time. This implies it should be possible to assign a weight of 1.0 to the PPI-I inflation rate (as shown in table 1), reflecting its full influence on the rate of inflation of the PPI-O over time.

The statistical evidence for New Zealand confirms that such a weighting is appropriate, so supporting the conclusion that the two inflation rates have on average moved together over the past decade (despite divergences over short periods of time).

CPI Inflation

It remains to specify the link between inflation in the PPI-O and inflation in the CPI. The estimation results reveal that inflation in the PPI-O and house price inflation, with allowance for the one-off effect of the introduction of GST (which is included in the CPI equation but not in the PPI-I or PPI-O equations⁷), provide a high degree of explanation of trends in consumer price inflation over the last decade. The weights are shown in table 1 (the GST term is not shown as it only has a temporary impact on the year-to-date inflation rate). The estimates indicate that the bulk of the change in the CPI is explained by movements in the PPI-O, with house price inflation included

Table 1
Principal Influences on PPI and CPI Inflation

Inflation Measure	Determinant	Estimated Weight
PPI-I	Inflation of unit labour costs	0.44
	Import price inflation	<u>0.56</u>
		<u>1.0</u>
PPI-O	PPI-I inflation	<u>1.0</u>
CPI	PPI-O inflation	0.91
	House price inflation	<u>0.09</u>
		<u>1.0</u>

and interest costs, and the margin applied to total production costs by business units. Therefore, differences in the rate of change of the two indices may arise if the incidence of wage costs in the two indices differs, if interest costs rise at a different rate to input costs, or if margins alter. Furthermore, as it appears that im-

port prices have a long-run impact on the PPI-I whereas export prices were found to affect the PPI-O in the short term, a shift in the terms of trade would produce a temporary divergence between the inflation rates of the two PPI indices.⁶

However, all of these potential contributors to a difference in the in-

⁶ Accordingly, the greater rate of inflation in the PPI-O than occurred in the PPI-I during 1986-87 may have arisen from greater wage inflation entering the PPI-O, rising interest rates, an increase in margins or the improvement in the terms of trade associated with the commodity price boom which began in 1985.

⁷ The Producer Price Index for both inputs and outputs *excludes* taxes and subsidies.

as a minor, but statistically significant, determinant of CPI inflation because of its direct influence on the housing component of the CPI regimen.

The estimated relationships discussed above represent the underlying influences on inflation, at both the producer and consumer level, that appear to provide a good summary description of the inflationary process in New Zealand over recent years. Because the estimated relationships reflect a sequence of pricing decisions, the two producer price relationships can be substituted into that for the CPI to derive the direct impact that the factors of interest have on the CPI. Furthermore, the two main explanatory factors which result, unit labour cost inflation and import price inflation, can be split into their respective components of productivity changes and wage inflation, and foreign price inflation, exchange rate changes and tariff rate changes. The final relationship, profiled in table 2, is used in the analysis of the 1985-88 disinflationary period which follows.

Table 2
'Core' Influences on CPI Inflation

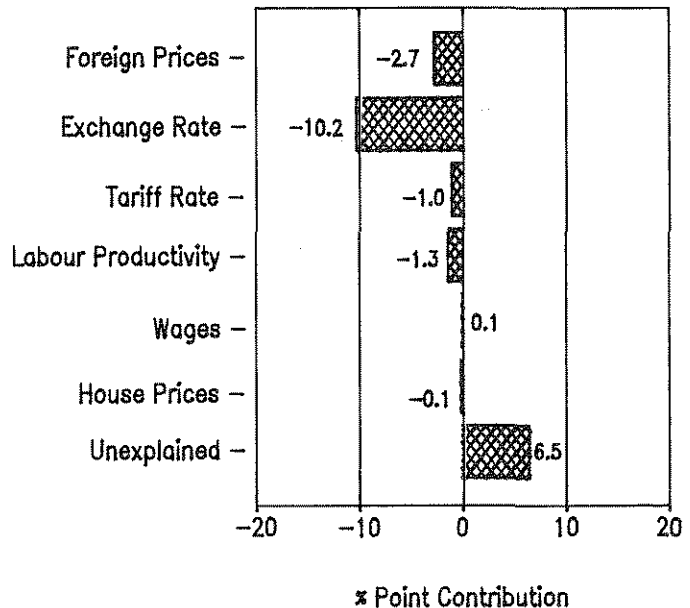
Determinant	Estimated Weight
Inflation of unit labour costs; comprising: - Productivity changes - Wage inflation	0.40
Import price inflation; comprising: - Foreign price inflation - Exchange rate changes - Tariff rate changes	0.51
House price inflation	0.09
	1.00

Analysing the Fall in Inflation

A historical breakdown of the contributions of the various influences on the fall in CPI inflation since 1985 has been derived using the relationship outlined in table 2, and is shown in figure 3. The size of each item represents the percentage point contribution a particular determinant is able to account for in the fall in CPI inflation. As an example, a contribution of some 10.2 percentage points from the overall appreciation of the exchange rate suggests that this factor *alone* more than accounts for the actual reduction in inflation of near 9 percentage points since March 1985. Figure 4 provides a similar breakdown of the relative contributions over the shorter 1987-88 period explaining a 13.5 percentage point decline in inflation from the point at which GST was introduced.

Interpreting figures 3 and 4, it is clear that there are large disparities in the contributions of the various influences and their relevance at

Figure 3
Contributions to the Fall in CPI Inflation over 1985 - 88



particular points over the disinflationary period. The largest disinflationary gains have been achieved from external factors, where the overall appreciation of the exchange rate, experienced since 1985, emerges as the single largest disinflationary influence. Lower foreign inflation (valued in foreign currency terms) evident over the 1985/86 period assisted in the disinflation process initially but accelerating world commodity price inflation since then has recently constituted a significant inflationary influence (as shown in figure 4). The effects of tariff reform have led to gradual reductions in the effective tariff rate and have contributed a relatively steady disinflationary influence over the entire period.⁸

Figure 3 suggests that the domestic sources of inflation have provided a weaker net disinflationary

⁸ The tariff rate term makes no allowance for the removal of import quotas and so will not reflect the full disinflationary pressure that has occurred due to reductions in border protection.

influence over the CPI than external factors over the full period. However, figure 4 shows that domestic sources have exerted a more significant disinflationary impact over the latter part of the period. Productivity gains, particularly evident since December 1987, represent a moderating impact on unit labour costs and emerge (aside from the passing-through of GST) as the most important domestic influence on disinflation, followed by reductions in the rate of wage inflation over 1987 and 1988.

Movements in house prices are estimated to have had an insignificant inflationary impact on the CPI over the period as a whole and over the latter part of the period.

As for the introduction of GST, the full period breakdown in figure 3 contains no GST term as the contribution to year-to-date CPI inflation over the entire period is zero – the positive impact of GST on year-to-date inflation was limited to a period of one year following its introduction. It is for this reason that GST appears in figure 4; the period for this figure begins at a point where GST had had an inflationary impact and the figure therefore captures the passing-through of the GST influence.

The combined domestic and external contributions represent the long run trend influences on inflation around which inflation could be expected to fluctuate over time. In the event, a strong positive residual item (representing unexplained or unidentified influences) over the 1985-88 period offsets the overall fall in inflation by around 6.5 percentage points, meaning that inflation fell by just over half of the extent to which the identified long run influences would suggest. One possible explanation for this apparent failure of inflation to adjust to the level implied by its underlying determinants is the presence of a degree of rigidity in producer or retail prices as input costs fell away.

For example, while some producers may have experienced lower input costs as a consequence of pro-

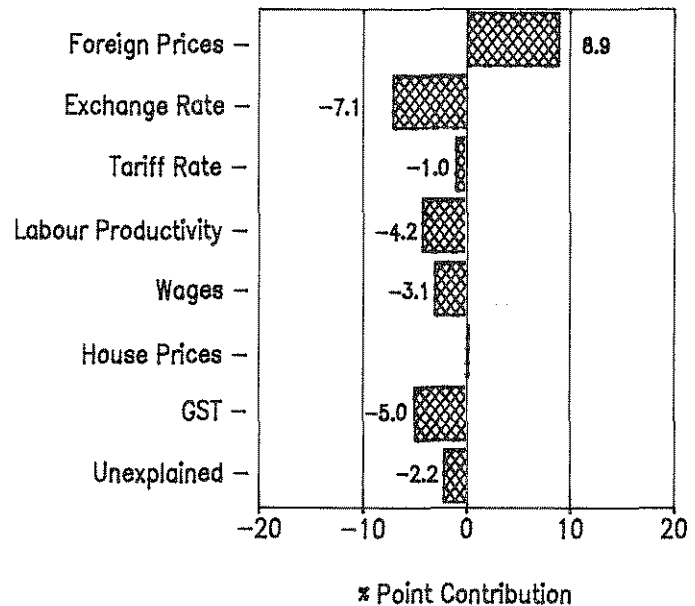
ductivity gains or a higher exchange rate, these gains may not have been fully reflected in a lower rate of inflation if producers chose to maintain output prices at current levels rather than passing the gains on in the form of lower prices.⁹ This possibility, which represents a form of downward price rigidity, could also arise in the case where inflationary expectations play a key role in the price-setting process. In the latter instance, price-setters may be reluctant to pass on apparently transient reductions in input costs (or input cost inflation) if these reductions are not perceived to be consistent with their expected future path for inflation. The small negative percentage point contribution of the residual item for the 1987/88 period suggests that these factors may have become less important at this time – an observation that is consistent with

price-setters having adjusted, slowly, to the disinflationary environment.

Further evidence that margins may have increased during the disinflationary period was shown in figure 2, where the Producers Price Index for outputs (PPI-O) inflated at a higher annual rate than the corresponding index for inputs (PPI-I) over 1986 and 1987. While this result is somewhat at odds with a more competitive pricing environment, it may nevertheless offer some explanation for the failure of consumer price inflation to fall by the extent implied by the principal determinants discussed here. It is, moreover, consistent with a scenario of a relatively slow adjustment in inflationary expectations by price-setters, despite significant reductions in 'core' or input cost inflation having been achieved.

An additional factor that could account for part of the difference between the 'core' CPI inflation track and the actual outcome, may be the sizeable impact that the ad-

Figure 4
Contributions to the Fall in CPI
Inflation over 1987 – 88



⁹ It could also be argued that margins were unusually compressed at the beginning of the period (because of the wage and price freeze) and this sequence of events merely allowed margins to return to a more normal level.

justment of government service charges had on inflation post-1984, as the prices for these services were altered to reflect more accurately their true cost of provision. Such a factor will not be captured by the core import price and labour cost factors and would be expected to be of less significance in the latter portion of the disinflationary period assessed here; an observation consistent with the smaller unexplained portion found over 1987-88.

Conclusion

This article sets down a framework for analysing the proximate influences on New Zealand's disinflationary experience over 1985-88. Of the factors found directly to influence trends in inflation of the CPI, a firming exchange rate was revealed as having made the strongest contribution to disinflation over the whole 1985-88 period. Domestic influences, including productivity gains and wage growth, have made a lesser contribution to the disinflationary process overall, although both factors have become more significant in reducing inflation post-1986.

In contrast, the claim that falling foreign inflation has been primarily responsible for the recent decline in this country's CPI inflation rate cannot be supported by the empirical evidence presented here. While foreign inflation did assist in reducing inflation over the early part of 1985-88, it has actually contributed to holding inflation up in the latter part of the period. Instead the factors found to have had the greatest impact on reducing inflation are those influenced by domestic monetary policy, chiefly the exchange rate.

