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## Editor's Note

Earlier this month, the Reserve Bank opened its new public heritage museum, a facility to document the Bank's history, display its valuable currency artefacts and explain the role it plays in the economy today. The museum, which is based on the ground floor of the Bank's premises in Wellington, is open to the public during weekdays. We hope that people with an interest in the origins of the Bank and its evolving policy role will find visiting the museum an informative and stimulating experience.

To mark the opening, it seemed fitting to include an article in this issue of the *Bulletin* on the events leading to the establishment of the Reserve Bank in August 1934. To that end, Matthew Wright of the Bank's Communications Department looks at the forces that culminated in the establishment of the Bank, which included the specific pressures created by the Great Depression as well as a push by Britain to see its Dominions establish their own central banks.

In the second article of this issue, David Hargreaves, Hannah Kite and I (all from the Economics Department) discuss some recent changes to the specification of the inflation process in the Bank's main policy model (known as the Forecasting and Policy System or FPS). The article presents some estimates of 'Phillips curves' for New Zealand, which relate the level of inflation to pressures on the economy's productive resources. A Phillips curve relationship appears to have held up reasonably well for non-tradables inflation (the portion

of CPI inflation emanating from the domestic economy) over the past decade. The article explains how this finding has been used to guide the redesign of the inflation system within FPS.

Assessing the quality of its forecasts of activity and inflation is something the Bank does regularly, since a forward-looking monetary policy is dependent on good quality projections of future inflation pressures. The last comprehensive review of our forecasts was published in 2002. In our third article, Jane Turner of the Economics Department provides an update of that work by comparing the Bank's projections for key economic variables with forecasts made by other forecasters over the past three years. The article finds that the Bank's forecast performance over this period has been broadly comparable to that of other forecasters. However, in the case of inflation and short term interest rates, the Bank's forecasts were slightly better than the average of other forecasts.

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## ARTICLES

# The policy origins of the Reserve Bank of New Zealand<sup>1</sup>

Matthew Wright

The Reserve Bank of New Zealand formally began operations on 1 August 1934, with responsibility for currency issue, debt management and the exchange rate. Although the establishment of the Bank can be seen partly as a response to the depression of the early 1930s, it also reflected forces that played out over much of the period following the First World War. Britain's push to see its Dominions establish their own central banks and the long-standing case for an independent New Zealand currency were both important factors shaping the debate around the case for a central bank. This article discusses these historical influences, the personalities that played a key role in the policy debate, and the events that culminated in the opening of the Bank.

## 1 Introduction

The Reserve Bank of New Zealand formally began operations on 1 August 1934. For the first time in New Zealand a body existed with authority over currency issue, debt management, the exchange rate, and other powers that could be drawn on as required.<sup>2</sup> This article looks into the policy origins of the Reserve Bank, through to the mid-1930s when a newly elected Labour Government introduced a Reserve Bank Amendment Act and the major debates of the period over the role and function of a central bank were broadly brought to a close.

In the 1930s, the pressures pointing to a Reserve Bank were not always seen with clarity, and some statements of the day reflected only aspects of the wider story.<sup>3</sup> Time provides a perspective unavailable to participants, allowing the origins of the Bank to be more clearly seen in the context of the day. In the widest sense, the Bank was the product of decades-long discussion and an Empire-wide move towards central banking, shaped by the early twentieth century rise of bureaucracies, world war, and the industrial, technical and

social change of the period. Britain was eager to see its self-governing Dominions go down this track.<sup>4</sup>

There was little question by the end of the 1920s that New Zealand would establish a central bank at some stage. Actually taking the step, however, reflected other pressures. In this respect, the depression of the early 1930s was an important factor, because it enabled the proposal for a central bank to effectively bridge the political spectrum. Parties of both left and right wanted one, although differing significantly on the control and role of the proposed organisation.

This was reflected in a tension between the vision of a central bank as an autonomous, largely passive bulwark of a New Zealand 'economic constitution', and one of a government agency playing an active role in the management of economic affairs in support of the government's overall policy. Policy argument therefore continued after the founding of the Bank, and the election victory of the Labour party in November 1935 meant that something closer to the latter vision eventually dominated the way the Reserve Bank was structured and run in subsequent decades.

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<sup>1</sup> I am grateful to Michael Reddell for his input into this article; Phil Briggs and Graham Howard for their work and advice on graphs; and Jo Rusk and the Reserve Bank Knowledge Centre, who provided invaluable research assistance.

<sup>2</sup> *New Zealand Statutes*, Geo. V, 24. See also eg, Neil Quigley (1989), 'Monetary policy and the New Zealand financial system: an historical perspective', in Reserve Bank of New Zealand (eds), *Monetary Policy and the New Zealand Financial System*, 3rd Ed, Reserve Bank of New Zealand, Wellington, p. 210.

<sup>3</sup> See, for example, J. G. Coates, (1933) 'The Reserve Bank of New Zealand Proposal', Wellington, p. 17; *New Zealand Parliamentary Debates* (NZPD), Vol. 236 (1933), p. 803.

## 2 Initial policy steps to 1930

The longer-term pressure driving the emergence of a Reserve Bank in New Zealand was currency issue and management. A government-run Colonial Bank of Issue briefly operated

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<sup>4</sup> John Singleton et al (2006), *Innovation and Independence*, AUP, Auckland, p. 10.



Top, Colonial Bank of Issue £5 note, 1850s, typical of colonial-era note design; centre, Bank of New Zealand £1 note, 1881, a characteristic late nineteenth century look; above, Bank of New Zealand £5 note, 1929, a style typical of early twentieth century issues. This particular series of notes were used as a conceptual basis for the first interim issue of Reserve Bank notes in 1934; features transferred across notably including the portrait of King Tawhiao. (Reserve Bank of New Zealand)

in New Zealand during the early 1850s,<sup>5</sup> but did not last and the onus for note issue fell back on individual banks. By the early twentieth century, the sole issuers of bank notes were the six main trading banks. Each issued currency under separate legislation, a parliamentary charter that required that the notes were convertible to gold; and that the banks held enough gold to support their issues.<sup>6</sup> The value of notes in circulation was thus tied to the bullion and securities held in New Zealand.<sup>7</sup>

<sup>5</sup> M. F. Lloyd-Prichard (1970), *An Economic History of New Zealand to 1939*, Collins, Auckland and London, pp. 63–65.  
<sup>6</sup> Quigley, p. 211.  
<sup>7</sup> B. C. Ashwin (1930), 'Banking and currency in New Zealand', *Economic Record*, Vols 5 & 6, 1929–1930.

There was no government agency managing the volume of notes issued, or any government effort to influence the volume of banks lending. Banks stood, in principle, on their ability to assure depositors of the convertibility of their notes into gold. There was thus no 'monetary policy'. Nor was there a 'New Zealand pound' as such, although in practice the banks did honour each other's notes.

When New Zealand entered the First World War in August 1914, the requirement to convert notes into gold was suspended, and never reinstated.<sup>8</sup> Superficially this switch away from gold convertibility, which followed the British lead in the war emergency, appeared to be a significant change. However, it had little practical impact for New Zealand. As Gary Hawke has observed, what had mattered for many years was the ability of the banks to meet customer demand for sterling balances – the funds in Britain that paid for imports.<sup>9</sup> This had disproportionate importance in early twentieth century New Zealand partly because London was the centre of the world financial system at the time; partly because Britain was by far the largest single export destination, and the dominant source of imports. In 1928, for example, Britain took £40.51 million of New Zealand's total exports, by value, of £56.18 million. The United States ran a distant second, Australia third. Imports followed a similar pattern.<sup>10</sup>

Increased bank lending on the New Zealand domestic market tended, all other things being equal, to increase customer demand for sterling. Consequently, the availability of sterling balances in the banks' accounts in London – arising from export receipts or capital inflows – became a major influence in the willingness and ability of the banks to increase lending.<sup>11</sup> This in turn influenced the level of spending and economic activity in the domestic economy.

In theory, once the gold convertibility link was suspended in 1914, the rate at which the New Zealand banks' notes

<sup>8</sup> An Order in Council, under Section 44 of the Finance Act 1916, permitted the six trading banks to count their securities in Britain and Australia against their note issues. See G. R. Hawke (1971), 'New Zealand and the return to gold in 1925.' *Australian Economic History Review* Vol. 11, p. 49.  
<sup>9</sup> Gary Hawke (1973), *Between Governments and Banks*, Reserve Bank, Wellington, p.16.  
<sup>10</sup> Lloyd-Prichard, pp. 297, 299.  
<sup>11</sup> Noted by Singleton, p. 9.

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were exchanged for sterling could have fluctuated freely, in order to balance the supply of – and demand for – sterling balances, the so-called ‘London funds’. In practice, the trading banks attempted to keep the rate around parity, nominally keeping a New Zealand five pound note equal in value to a Bank of England five pound note, and adjusted their lending policy accordingly – in effect, ‘rationed’ access to sterling funds as a mechanism for maintaining parity. This was, as Bernard Ashwin and other observers noted, effectively a ‘de facto ... sterling exchange standard’,<sup>12</sup> and it reflected the standard orthodoxy of a time when a fixed exchange rate was regarded as the natural and appropriate way to order financial affairs. Britain returned to the gold standard in 1925, at long-standing pre-war parities, partly for these reasons.

A complicating factor for New Zealand was the fact that four of the six trading banks were Australian owned. These banks each held a single pool of sterling balances, reflecting the activities and needs of both Australian and New Zealand customers. This meant that, in principle at least, the state of Australia’s foreign trade affected the availability of credit and foreign exchange in New Zealand. Ashwin has argued that the New Zealand exchange rate was ‘governed to a preponderating extent by Australian conditions’.<sup>13</sup> This linkage – which had both advantages and disadvantages – became a focus of the New Zealand debate in the late 1920s, when the weak Australian trade position was putting downward pressure on the exchange rates of both countries, pushing them away from the norm of parity with sterling, even though New Zealand’s own trade accounts were in surplus.

Governments of the late 1920s had no tool with which to address this or any other monetary issues; the only actual instruments of economic management then in government hands revolved around adjustments to government revenue and expenditure, ‘fiscal policy’. Although the economy was heavily dependent on foreign trade, concentrated in a few commodities in a single market, there was no mechanism to adjust or manage the exchange rate, no mechanism to

influence interest rates, and no mechanism to influence the availability of credit.

This was the gap that a central bank came to fill. Central banks, some established by statute, often with private shareholders, were more common internationally by the early twentieth century and had begun to assume a central role in the financial system. The most prominent was the Bank of England. The US Federal Reserve system was established in 1913, and by the 1920s all the major European nations had central banks.

These institutions emerged at a time when there was intense debate over how to manage monetary affairs in the developed world; in the United States, for instance, one Presidential election was fought largely around the role of gold. More radical thinkers increasingly saw an active role for the state in the management of banking and money, going beyond simply maintaining an exchange rate peg such as the gold standard.

New Zealand was not immune to the debate. Setting aside the Colonial Bank of Issue, which was driven fairly directly by currency issue needs, the notion of a more active role for the state in the economy emerged periodically during the later colonial period and after, particularly whenever there was a period of economic or financial stress.<sup>14</sup> The Legislative Council, New Zealand’s Upper House, passed a motion in 1884 recommending that the government establish a state bank of note issue. Pressure for change increased the following decade when the government obtained a share in the Bank of New Zealand as a result of the banking crisis of 1893; there were calls for the government to use this organisation to influence interest rates and even ‘undertake some central banking functions’.<sup>15</sup> There were regular calls to use this bank as a government policy instrument, even to influence interest rates, but in the event no steps were taken.<sup>16</sup>

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<sup>12</sup> Ashwin, p. 194.

<sup>13</sup> *Ibid.*, p. 198.

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<sup>14</sup> Reserve Bank of New Zealand (1955), *Monetary and Fiscal Policy in New Zealand: submissions to the Royal Commission on Monetary, Banking and Credit Systems 1955*, Reserve Bank of New Zealand, Wellington, p. 6. Hereafter *Monetary and Fiscal Policy*.

<sup>15</sup> Quigley, p. 209.

<sup>16</sup> See, eg, *Monetary and Fiscal Policy*, p. 6.

There was also no central bank of issue, and in 1911 the Liberal government – reformist and seeing a larger role for the state in everyday life – introduced a New Zealand Notes Bill, intended to give the government sole right of note issue. This lapsed when the Liberals lost office in November. Reform came to power, under William Massey – a Premier who was, as N. M. Chappell put it, ‘as wedded to conservatism as he was to the soil’.<sup>17</sup>

Arguably the relative conservatism of Massey’s administration hindered New Zealand’s adoption of a central bank. However, external pressures to establish one continued to grow, particularly after the First World War. Britain was eager to see its Dominions establish their own central banks in wake of the war, and the idea was discussed in Imperial conference as early as 1920, and again in 1923.<sup>18</sup> Much of the drive behind this came from a desire to restore the stability in national and international finance of the pre-war period. A central bank, on this conception, was part of re-establishing the norm of the gold standard; and central banks were also seen as institutions which should operate at arm’s length from government.

These relatively conservative views stood in some contrast with those of New Zealand’s Labour Party of the period, which also wanted a state bank and saw potential in turning the Bank of New Zealand into one. However, the focus was quite different in that Labour envisaged an explicitly state owned and managed central bank, seeing any organisation largely as a device for keeping the banking sector under control and interest rates low.<sup>19</sup>

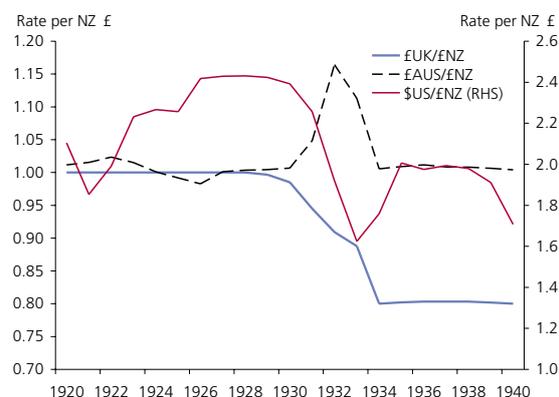
Massey did not entertain such notions, and this position was not so anomalous by Imperial standards. Australia had set up a Commonwealth Bank in 1911, but this had very limited powers by comparison with a full central bank. Canada and Ireland did not have central banks either at this time. However, although Massey died in office in 1925 and was succeeded by the more centrist former Railways Minister Gordon Coates, a central bank remained off the government policy agenda and very much a platform of the Labour left,

<sup>17</sup> N. M. Chappell (1961) *New Zealand Banker’s Hundred; a history of the Bank of New Zealand 1861–1961*, Bank of New Zealand, Wellington, p. 269

<sup>18</sup> Hawke (1973), *Between Governments and Banks*, p.15.

<sup>19</sup> *Ibid.*, pp. 14–15.

Figure 1  
New Zealand exchange rates 1920–40



Source: *Looking at the Numbers*, Phil Briggs; derived from Engel, Charles and Chang-Jin Kim (1999) ‘The long run US/UK real exchange rate.’

which at that time had a relatively radical image. Temporary wartime legislation remained in force; New Zealand did not follow Britain back to the gold standard in 1925, and as late as 1928 another Proclamation extended the wartime legislation.<sup>20</sup>

This ongoing succession of stop-gap measures, coupled with the difficulties flowing from the exchange-rate and sterling reserve relationship with Australia, finally prompted action. The 1929 budget, issued by the United administration, ostensibly under the ageing and ailing ex-Liberal Sir Joseph Ward, in practice guided by his deputy, George Forbes – called for a review of the temporary legislation covering banking, foreign exchange and currency matters, and its replacement with a permanent statute.<sup>21</sup> The proclamation covering legal tender was due to expire in January 1932.<sup>22</sup>

By this time the notion of a central bank had gained ground with The Treasury. As Malcolm McKinnon has argued, Treasury officials saw an independent central bank as an important economic tool by this time.<sup>23</sup> This was particularly emphasised by the developing discount rate on the pound in 1930. The exchange rate was under pressure via the sterling reserve mechanism; as Hawke has shown, the ‘failure of the

<sup>20</sup> Ashwin, p. 194.

<sup>21</sup> See, eg. Archives New Zealand T52/625, Acting Prime Minister to Chairman of Directors, Bank of New Zealand, 2 September 1930; also *Evening Post*, 3 September 1930.

<sup>22</sup> AJHR 1931 B-3 ‘Banking and Currency in New Zealand, Report on’, Sir Otto Niemeyer, p.1, hereafter ‘Niemeyer Report’.

<sup>23</sup> Malcolm McKinnon (2003), *Treasury*, Auckland University Press, Auckland, p. 124–125.

banks to distinguish between New Zealand and Australia' meant that the New Zealand pound was discounted against the sterling.<sup>24</sup> This flew in the face of a positive trade balance at that time, which prompted suggestions that the New Zealand pound should instead be set at a premium – a situation that Arnold Hore, then with the New Zealand High Commission in London, thought could be remedied with a central bank.<sup>25</sup>

The Treasury vision was consistent with orthodox Bank of England thinking, which envisaged an independent central bank, founded on a return to fixed exchange parities as a way of assuring 'sound money' and of differentiating New Zealand's financial position more clearly from Australia's. It was broadly supported by the urban business community, and first articulated in 1930 by Bernard Ashwin, a young Treasury economist. In an influential paper he concluded – among other things – that New Zealand's note issue should be fully covered by government securities; and that a 'Note Issue Board' should be formed which might 'in due course form the nucleus of a Central Bank'.<sup>26</sup>

### 3 Depression influences on policy

The worldwide depression that began to bite across Australasia during 1930 had significant and decisive effects for New Zealand. Export values fell sharply (figure 2), and estimates suggest that New Zealand's GDP fell by around 17 per cent between 1929 and 1931 (figure 3).<sup>27</sup> Commodity prices fell about 40 per cent, consumer prices by around 20 per cent (figure 4), unemployment rose sharply, and there was a sense of popular crisis.<sup>28</sup>

The Australian situation was more serious, not so much because commodity prices fell more sharply, but because concerns about Australian indebtedness meant that access to external credit was cut off, putting downward pressure on the exchange rate.

The Australian problem was of key importance for New Zealand because of the mingling of the sterling reserves.

<sup>24</sup> Hawke, p. 22.

<sup>25</sup> McKinnon, p. 125.

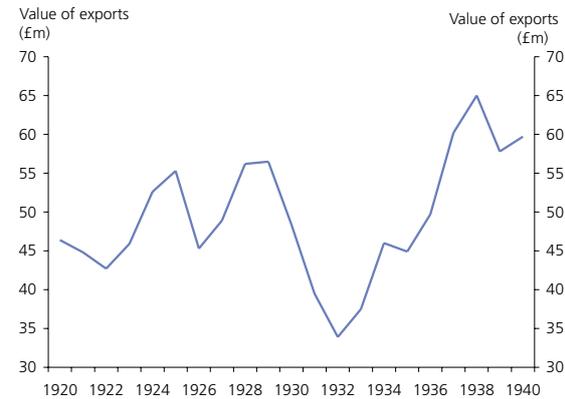
<sup>26</sup> Ashwin, p. 204.

<sup>27</sup> *Ibid.*, p. 697.

<sup>28</sup> Lloyd-Prichard, p. 379.

Figure 2

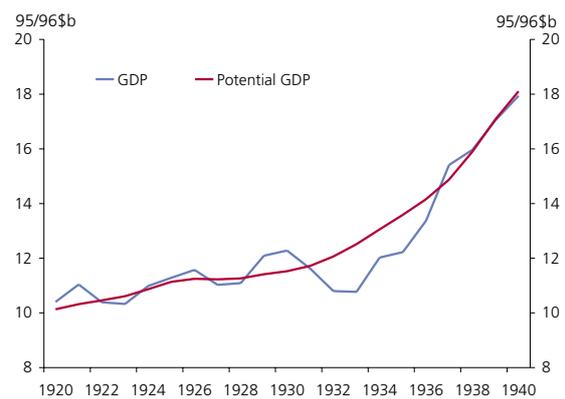
#### New Zealand exports by value 1920–40



Source: M. F. Lloyd-Prichard, *An Economic History of New Zealand to 1939*.

Figure 3

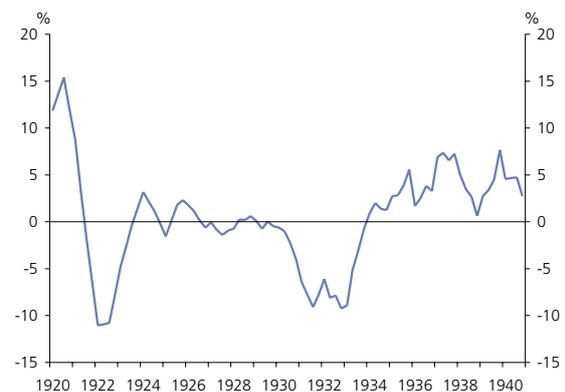
#### New Zealand's estimated Gross Domestic Product, 1920–40 (real vs potential)



Source: *Looking at the Numbers*, Phil Briggs: sourced from Keith Rankin (1991), "Gross national product estimates for NZ 1859–1939" and Brian Easton "A GDP deflator series for New Zealand 1913/14–1976/77"

Figure 4

#### New Zealand CPI 1920–40



Source: Statistics New Zealand.

When these were run down by the Australian banks in the face of the crisis, New Zealand suffered. As Prime Minister and Minister of Finance George Forbes remarked, the 'close banking association' with Australia and consequent link with Australian economic fortunes was significant.<sup>29</sup> London financiers also conflated New Zealand with Australia, though the economic situations faced by the two Dominions were quite distinct in practice.<sup>30</sup>

The New Zealand government took some time to respond seriously to the depression. In the inter-war years, trade and economic activity were volatile, and in orthodox circles it was generally thought that the best way to manage these fluctuations was to allow market disciplines to work, while keeping government finances in good order. This was expressed in an early focus on budget-balancing. However, the depth of the depression with its pervasive and concrete impact across the whole of New Zealand, including a material loss of public confidence in the trading banks, finally prompted a more active approach to economic management, both in New Zealand and abroad.

Economic advisers did not have a well developed framework for analysing the options, and in any case, economic analysis confronted powerful conflicting sectional interests. For example, farmers – many of whom had very large debts – now faced sharply lower export prices, and were generally sympathetic to anything that would ease their debt-service burden and raise their incomes, such as an exchange rate depreciation. Urban businesses, by contrast, while also facing a downturn, had little interest in a depreciation and regarded 'sound money' as underpinning business confidence and their willingness to invest. Urban employees – at least those in employment – had little interest in a depreciation that would raise their cost of living.

After intense debate, a variety of relatively unorthodox measures were eventually adopted. These included legislative debt relief, involuntary cuts in interest rates, emergency work schemes, and – after a significant debate – the first active state involvement in depreciating the exchange rate.



Sir Otto Ernst Niemeyer, CBE, KCB (1883-1971), seen here in the late 1940s. (Bank of England)

This was the immediate context from which the Reserve Bank finally emerged. Yet the path was by no means certain or obvious even then. Although the broad policy context on both sides of the political spectrum remained in favour of establishing a central bank by this time, there was no particular impetus towards actually doing so, and the trigger for action in 1931 was, to some extent, fortuitous. It happened that two senior British officials were due to visit Australia, broadly to advise on the Australian financial crisis.<sup>31</sup> According to Hawke, the idea to extend their visit to New Zealand originated with Secretary of the Treasury A D Park, who saw a newspaper report and forwarded it to Forbes with the recommendation that the British officials look into New Zealand.<sup>32</sup> Certainly the impetus came from The Treasury,<sup>33</sup> and the idea also fell on fertile ground in England. However, the decision to seek British advice was not surprising; as Frank Wood put it, New Zealand was Britain's 'most dutiful daughter',<sup>34</sup> and major policy decisions

<sup>29</sup> Hawke (1973), p. 28

<sup>30</sup> Singleton, p. 9.

<sup>31</sup> For analysis see, e.g. Alex Millmow (2004), 'Niemeyer, Scullin and the Australian economists', *Australian Economic History Review*, Vol. 44, No. 2.

<sup>32</sup> Hawke, pp. 26-27.

<sup>33</sup> McKinnon, p. 126.

<sup>34</sup> Cited in W. B. Sutch (1966), *The Quest for Security in New Zealand*, Oxford University Press, London, p. 166.

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in a variety of fields were invariably undertaken only after obtaining the advice of British officials.

In July, the Government formally invited the officials to travel on to New Zealand. The advisory group comprised Sir Otto Ernst Niemeyer, CBE, KCB, of the Bank of England; and Professor Theodore E. G. Gregory, of the University of London.<sup>35</sup> Niemeyer had been with the British Treasury from 1906 to 1927, and with the Bank of England since 1927, was a Director of the Bank of International Settlements, and Deputy Chairman of Vickers-Armstrong Ltd among other positions.<sup>36</sup> By contrast with Australia, where he was seen in some circles as Britain's 'receiver', Niemeyer had a purely technical brief for New Zealand. He was asked to investigate and report on 'questions of banking, currency and exchange'. Forbes enclosed a copy of the Ashwin paper for Niemeyer's background, and the visit took place in August and September 1930.<sup>37</sup>

Public response to the news was varied. Lobby groups such as the Auckland and Hamilton Chambers of Commerce wanted the Government to expand the brief. These requests were politely declined.<sup>38</sup> There was extensive interest from the financial community, including requests by the trading banks to meet Niemeyer and Gregory.<sup>39</sup> At other levels, however, there was some public difficulty distinguishing Niemeyer's New Zealand brief from the one he had in Australia. One newspaper speculated that Niemeyer's arrival might give a 'wrong impression overseas' about New Zealand's financial standing, particularly in light of the depression-induced decline of the primary commodity markets. The *Dominion* opined 'A visit from one whom Australia has grimly dubbed "the bailiff" is not an occasion for rejoicing', adding that it would be 'absurd to suppose ... that Sir Otto possesses any economic cure-all'.<sup>40</sup> The *Evening Post* was more up-beat.

'The Government are to be congratulated on their disregard of this fear.'<sup>41</sup>

Surviving correspondence shows that Niemeyer was diligent and thorough; he met officials, corresponded with Park on matters such as public debt, and plied Park with reports regarding central banking elsewhere.<sup>42</sup> The review that followed, formally the 'Report on Banking and Currency in New Zealand', more commonly the 'Niemeyer Report', was published in New Zealand in 1931.

Niemeyer considered a central bank pivotal to any lasting structure, and recommended a 'Reserve Bank of a size appropriate to New Zealand's conditions', charged with note issue, stability of the exchange rate, and holding the reserve balances of the trading banks. Such a bank should be 'entirely free from both the actual fact and the fear of political interference', on the basis that without it, a central bank would 'do more harm than good'.<sup>43</sup> He backed his report with a long commentary to Park, posted from Rio de Janeiro,<sup>44</sup> enclosing the report 'which you can publish', along with suggested draft legislation. He also had 'some private comments on confidential points'.<sup>45</sup> These apparently included doubts that a Reserve Bank could be hastily established – legislation would take 'some months', and other 'immediate steps' were needed to meet the situation.<sup>46</sup>

Another telegram followed on 17 February,<sup>47</sup> and Niemeyer had more to say in the covering letter that went with the report two days later, recommending – among other things – that the government should sell its shares in the Bank of New Zealand once a Reserve Bank was in operation.<sup>48</sup>

Such advice was conservative, and reflected the standard Treasury and Bank of England orthodoxy of the day. A

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<sup>35</sup> *Dominion*, 4 September 1930.

<sup>36</sup> T52/625, extract from *Who's Who* 1933.

<sup>37</sup> Hawke (1973) p. 26.

<sup>38</sup> T52/625, Associated Chambers of Commerce to E. A. Ransom, 19 September 1930; Acting Prime Minister to the Secretary, Associated Chambers of Commerce, 24 September 1930; Hamilton Chamber of Commerce to the Prime Minister, 6 September 1930.

<sup>39</sup> *Op cit*, Chairman of the Banks to Acting Prime Minister, 2 September 1930.

<sup>40</sup> *Dominion*, editorial, 3 September 1930.

<sup>41</sup> *Evening Post*, 3 September 1930.

<sup>42</sup> T52/625, Niemeyer to Park, 18 September 1930 and attachment.

<sup>43</sup> Niemeyer Report, p. 4.

<sup>44</sup> *Op cit*, High Commissioner for New Zealand to Secretary for the Treasury, cablegram, 4 February 1931.

<sup>45</sup> *Op cit*, Niemeyer to Park, 23 January 1931, Niemeyer's emphasis.

<sup>46</sup> *Op cit*, High Commissioner for New Zealand to Secretary for the Treasury, cablegram, 4 February 1931.

<sup>47</sup> *Op cit*, High Commissioner for New Zealand to Secretary for the Treasury, cablegram, 17 February 1931.

<sup>48</sup> *Op cit*, Niemeyer to Park, 19 February 1931.

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central bank would manage the note issue and restore a solid foundation for money in New Zealand, independent of any political interference. This was not a vision of any sort of active monetary management. Niemeyer's advice was also predicated on the development of a central bank within a reasonable time-frame. However, in the event it took another three years for legislation to be passed; while a central bank was on the agenda in wake of Niemeyer's report, it was not a priority. But the groundwork had been laid, and there was wider consideration of the concept over the next few years.<sup>49</sup>

## 4 Formulating a Reserve Bank Act

Debate over a central bank for New Zealand in the early 1930s – politically independent or otherwise – encompassed a wide range of lobby groups, politicians, government officials and economists. Even the news that Niemeyer was writing the report spurred some to action, among them Hislop, who prepared a detailed proposal for a central bank in January 1931.<sup>50</sup> He may have viewed a central bank within the context of measures to get New Zealand clear of the depression; certainly his subsequent correspondence with Forbes was couched in terms of strategies to do so.<sup>51</sup> The idea that a central bank might rescue New Zealand from the economic crisis also surfaced later in parliamentary debate.<sup>52</sup> Other private input came from such individuals as F. C. Morris, who laid out his conception of a central bank in *The Accountant* in February 1931.<sup>53</sup> The expatriate New Zealand economist D. B. Copland added a voice to the debate, advocating exchange-rate adjustment as a means of relieving the plight of primary producers.<sup>54</sup> Reform Party leader and Deputy Prime Minister Gordon Coates also seems to have toyed with this concept at the time.<sup>55</sup>

Niemeyer's report was published in May 1931, but further progress depended on government. As Singleton has argued, Government at this time – meaning, effectively, Forbes, who was both Prime Minister and Minister of Finance – viewed a Reserve Bank as a 'technical measure', distinct from the policies needed to cope with the depression.<sup>56</sup> This was consistent with the relatively passive vision for the role of a central bank that had shaped Niemeyer's recommendations. Forbes clearly regarded other policies as higher priority – particularly given that the broad Reserve Bank proposal had emerged from long-standing trends, not the depression emergency. So although Forbes presented Niemeyer's report to the Committee of Supply at the end of July, he was lukewarm towards the idea of a central bank, presenting the paper with the rider that 'as some far-reaching changes are involved, and the matter is a very important one', any decisions 'should not be rushed'.<sup>57</sup>

Later in 1931 Forbes called for a grand all-party coalition to face the depression emergency. Labour rejected the offer; Reform prevaricated and eventually agreed, and the coalition formed in September, leaving Labour as the only significant opposition party. There was still no real opportunity to consider a Reserve Bank, however, as elections were due in December and political attention turned to the campaign. The coalition was returned to power, though Forbes handed over the Finance ministry to William Downie Stewart.

Park seized the moment to put the Reserve Bank proposal forward, but Forbes remained reluctant to reopen debate.<sup>58</sup> Later in 1932, however, Forbes, Deputy Prime Minister J. Gordon Coates and Stewart went to the Imperial Conference in Ottawa. When the role of central banks was discussed, delegates observed that New Zealand was 'almost unique in the British Empire in being without a responsible organisation of this nature'. This was something of an exaggeration – Canada, India and Australia did not have central banks as such either – but Coates, for one, was 'satisfied' after discussions with 'most competent authorities' in Ottawa that 'the creation of a Central Bank in New Zealand will

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<sup>49</sup> Singleton, p. 10; Hawke, pp. 30–31.

<sup>50</sup> T52/625, Mayor of Devonport to Forbes, 19 January 1931.

<sup>51</sup> *Op cit*, Mayor of Devonport to Forbes, 4 February 1931.

<sup>52</sup> NZPD Vol. 246, p. 841.

<sup>53</sup> T52/625, F.C. Morris, 'The Essential Functions of a central bank', 28 February 1931.

<sup>54</sup> Greasley and Oxley, p. 705.

<sup>55</sup> Michael Bassett (1995), *Coates of Kaipara*, AUP, Auckland, p. 188.

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<sup>56</sup> Singleton, p. 10.

<sup>57</sup> AJHR 1931, B-6, 'Financial Statement', p. 19.

<sup>58</sup> Observed by McKinnon, p. 127.



J. G. Coates, (1878–1943), Member of Parliament for Kaipara and a key figure behind the 1933 effort to establish a Reserve Bank in New Zealand. (S. P. Andrew Collection, Alexander Turnbull Library F-19049-1/1)

be a step in the right direction'.<sup>59</sup> The delegation went on to London; and here, Bank of England Governor Montagu Norman also urged that New Zealand should establish its own central bank, this time on the logic that it would enable New Zealand to gain full economic independence from Australia.<sup>60</sup>

Forbes seems, at last, to have been swayed. Stewart drafted a Reserve Bank Bill, in which shares would be held by private shareholders as well as the government, and which would operate independently from the government. Work also began on the design of a series of bank notes. However, the legislation was shortly killed when Forbes decided to bring the parliamentary session to an early close.<sup>61</sup> There was intense debate during this period on the exchange rate, and whether a devaluation was inevitable or appropriate. The British pound had gone off gold in 1931, and now floated; but as New Zealand's trade was mainly with the United Kingdom, this did little directly for New Zealand exporters.

<sup>59</sup> AJHR 1932, A-6B, 'Imperial Economic Conference, Ottawa, 1932', p. 8.

<sup>60</sup> Hawke, p. 30.

<sup>61</sup> *Ibid.*

There was substantial tension between the old economic orthodoxies, and the agitation for measures to relieve pressure on the politically powerful farming sector. In January 1933 the Government finally instructed the banks to reduce the exchange rate to £125 New Zealand to £100 sterling, and agreed to indemnify the banks against losses on future exchange rate movements. Stewart resigned in protest,<sup>62</sup> and Coates became Minister of Finance in his stead.<sup>63</sup>

Coates' approach was distinct. In many respects he bridged the traditional left-right political divides, and his policies reflected this orientation. Although broadly conservative, he had a record for intervention – particularly in terms of public works and services – and had been repeatedly criticised for being too 'socialist'.<sup>64</sup> Yet from the socialist perspective he was too conservative, and he was eventually demonised by both parties. This masked his other qualities, as some of his contemporaries knew at the time, and as some historians have observed since.<sup>65</sup> William Sutch, writing as a champion of the left, considered Coates the 'only man of statesmanlike qualities' in the Coalition Government, crediting him with setting up the platform from which Labour was able to launch its own policies – including the Reserve Bank.<sup>66</sup>

Coates' enthusiasm for a central bank flowed in part from the policy debates of previous years, in part from the situation created by the depression. However, although the notion of a central bank had been bandied about in policy circles for some time, it still needed selling to the general public and to some extent to lobby groups. Coates introduced the idea with a press campaign during 1933, arguing that the bank would promote stability and produce 'cheaper credit' through its control of the bill market.<sup>67</sup> Nor was such an institution superfluous in a small country. 'One might just as well say that a throttle and brakes are necessary in a large motor bus, but are superfluous in a small car'.<sup>68</sup> He also explored some of the fallacies that had been put about in regard to the effects of a Reserve Bank, including the idea

<sup>62</sup> Greasley and Oxley, p. 697.

<sup>63</sup> Sutch, *Recent Economic Developments*, pp. 32–33.

<sup>64</sup> Easton, pp. 30–31.

<sup>65</sup> e.g., Bassett.

<sup>66</sup> Sutch, pp. 167–168.

<sup>67</sup> J. G. Coates (1933a), 'Reserve Bank of New Zealand Proposal', Wellington, p. 4.

<sup>68</sup> *Ibid.*, p. 12.

that it would simply hand control of New Zealand's currency to the Bank of England. There had been public talk of a 'vast conspiracy alleged to be operating through central banks for the economic enslavement of the world in general'. Coates did not even attempt to dignify this 'fantastic' notion with argument.<sup>69</sup> These efforts, however, did not sway the trading banks, which remained consistently opposed to the notion of a central bank.

The detailed control and functions that Coates saw for a Reserve Bank has to be seen in context of his political views. Where Niemeyer sought political independence, Coates considered that overall control rested with government, defining independence instead as freedom from 'the fact, as well as the suspicion, of being influenced by other than the economic welfare of the Dominion as a whole'.<sup>70</sup> However, this did not mean direct day-by-day interference at an operational level, either from government or business groups; and he appears to have been seeking a balance. To reduce the risk of undue private-enterprise influence he put the Secretary of the Treasury and three government officials into the Board and reduced the vote of the public shareholders. He envisaged government taking a direct role in selecting Board members, along with power of veto over selection of the Governor and Deputy Governor. He also envisaged government oversight of the 'monetary system'.<sup>71</sup> This was in many respects a 'middle ground' between the market freedom envisaged by Niemeyer, and the government control advocated by Labour.

Other divergence from Niemeyer was presentational, arguably a function of Coates's need to sell a central bank to public, politicians and sector groups alike. For both Niemeyer and Coates a main theme remained 'stability', but Niemeyer thought the Reserve Bank should have control over money and credit in order to stabilise the value of its notes.<sup>72</sup> The 1932 draft legislation took the word 'stability' to mean the Reserve Bank had control of money and credit.<sup>73</sup> However, the 1933 legislation drafted under Coates' guidance referred instead, in Clause 12, to control 'over monetary circulation



*The first note series issued by the Reserve Bank in 1934 was intended as a temporary measure until more permanent notes could be designed. (Reserve Bank of New Zealand)*

and credit' in New Zealand, so that 'the economic welfare of the Dominion may be promoted and maintained'.<sup>74</sup> When challenged in the House over whether the Bank could prevent 'trading cycles – periodic inflation and deflation', Coates insisted that it could 'exercise a steady influence'.<sup>75</sup>

One matter that was never debated by politicians of either persuasion was the role of the Reserve Bank in note issue; this was taken as given, and the first series of Reserve Bank notes were in design by 1933, despite the rather bumpy legislative path associated with the organisation that was expected to issue them. They were designed in some haste and widely viewed as interim until a 'proper' series of designs could be developed at more leisure once the Reserve Bank was operational.<sup>76</sup> However, the principal arguments regarding currency were not over whether the Bank should issue it, still less the designs; but over how the issue would be backed. Coates had his own views, and temporarily rejected tying the New Zealand pound to the British pound at parity – which would have involved reversing the 1933 devaluation.<sup>77</sup> For all that, the thrust of his legislation was generally conservative; as Hawke has observed, the functions adopted for the

<sup>69</sup> *Ibid.*, pp. 16–17

<sup>70</sup> *Ibid.*, pp. 3, 5.

<sup>71</sup> *Ibid.*, pp. 5–6.

<sup>72</sup> Quigley, p. 210.

<sup>73</sup> Hawke, p. 32.

<sup>74</sup> 24 Geo. V, Reserve Bank of New Zealand Act 1933, Clause 12.

<sup>75</sup> NZPD, Vol. 236, p. 895.

<sup>76</sup> Reserve Bank of New Zealand (2006), *Explaining New Zealand's Currency*, Reserve Bank, Wellington, p. 5.

<sup>77</sup> J. G. Coates (1933a), 'Reserve Bank of New Zealand Proposal', Wellington, p. 14.

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Reserve Bank of New Zealand were the usual functions of a central bank at the time.<sup>78</sup>

The Reserve Bank Bill 1933 was presented to Parliament in late October amid substantial and brisk discussion. The second reading was interrupted, though Forbes demanded urgency; and that itself provoked a debate. Michael Joseph Savage, leader of the Labour opposition, wanted the bill 'thoroughly discussed', and the House agreed. The debate that followed, on Friday 27 October, and Tuesday 31 October – lasting through until 1.26 a.m. on 1 November – occupies nearly 100 pages in print.<sup>79</sup> Discussion was politicised between right and left, predictably reflecting the positions already brought to the policy debates leading up to the bill. Labour was accused of wanting to 'control the Bank'.<sup>80</sup> There were also suggestions that the Government was handing over sovereign rights. Finally the House agreed to read it a second time, and did so probably around midnight on 31 October.<sup>81</sup>

The Bill was passed by the House and given royal assent by the Governor-General on 27 November.<sup>82</sup> The precise relationship between government and central bank was left ambiguous – a point Labour immediately attacked.<sup>83</sup>

Choice of Governor was another contentious issue. This was something of a *fait accompli* by the time Coates introduced the 1933 legislation; the process had begun in 1932, when Norman quizzed Park on the best procedure. Park initially thought New Zealand would have to advertise, but Norman, on his own initiative, offered an official from the Bank of England's own staff. Park then met Leslie Lefeaux, the Chief Cashier – a position of more substantial import than the bland meaning of the title might suggest. This offer was not something to be turned down lightly, but the decision was set aside while the New Zealand legislation lay in abeyance.

Lefeaux appears to have been simply given the job in wake of the 1933 legislation. The news came amid public speculation that New Zealand's central bank would merely be subservient to the Bank of England – with all that this



Leslie Lefeaux, Governor of the Reserve Bank 1934-40. Portrait by Archibald F. Nicoll. (Reserve Bank of New Zealand)

implied – and Coates had to address allegations that Lefeaux had been appointed on Bank of England advice. It was a difficult question to answer; Lefeaux had actually been put forward at the Bank of England's initiative, something Coates could not deny. But the appointment, Coates insisted, was made 'on the basis of his personal qualifications'.<sup>84</sup>

Ultimately this was finessing; to the uninitiated it did look as if New Zealand had merely bent to British advice. However, in context of the period Lefeaux's appointment was hardly unusual. As we have seen, New Zealand looked to Britain for advice and guidance; and senior officials in new departments of the day often did come from the 'mother country'. From the policy perspective the more crucial point was, as Hawke has argued, that Lefeaux's ideals broadly coincided with Coates' concept of the Bank.<sup>85</sup>

The Reserve Bank commenced operations on 1 August 1934. Curiously, although the key dates were well signalled in advance, there were no premises. Lefeaux apparently began work in the Postmaster-General's office while the latter was on holiday. He envisaged 20 staff. In the event, 60 were

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<sup>78</sup> Hawke (1973), p. 33.

<sup>79</sup> NZPD, Vol. 236, pp 797–896.

<sup>80</sup> *Ibid.*, p. 829.

<sup>81</sup> *Ibid.*, pp. 895–896.

<sup>82</sup> Hawke (1973), p. 31.

<sup>83</sup> *Ibid.*, p. 61.

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<sup>84</sup> *Ibid.*, pp. 52–53; NZPD, Vol. 238, p. 394.

<sup>85</sup> Hawke (1973), pp. 63–64.



On its first day of operation, the Bank issued this cheque, equating to around \$2.15 billion in mid-2006 dollars. (Reserve Bank of New Zealand)

required, and temporary accommodation was shortly found in the Dominion Farmers building.<sup>86</sup>

The Bank brought with it a number of changes to the economic environment. Among other things, trading bank notes were replaced with Reserve Bank notes; the Government bank account was shifted from the Bank of New Zealand to the Reserve Bank; the Reserve Bank also took over the gold reserves from the trading banks, acquired the government's own foreign exchange reserves; and took responsibility for managing a fixed exchange rate at £125 New Zealand to £100 sterling. The trading banks were required to hold reserve balances at the Reserve Bank, and the Reserve Bank set a discount rate at which it would lend to banks.

These were significant changes. However, Coates did not want the public to get their hopes up: 'we must ... not expect an improved monetary system to be a panacea for all our economic ills'.<sup>87</sup> This again reflected the longer-term policy origins of the Bank. It is not the function of this article to assess the degree to which the Reserve Bank then contributed to the recovery from the depression. At the time, A. H. Tocker attributed the decline of interest rates during 1934 to the Reserve Bank.<sup>88</sup> Subsequent views differ.<sup>89</sup> What matters from the policy perspective is that by 1934 a new institution had been put in place to enable New Zealand to handle future shocks and disruptions more effectively.

<sup>86</sup> Singleton, p. 13.

<sup>87</sup> *Ibid.*

<sup>88</sup> A. H. Tocker (1934), 'The Establishment of Central Banking in New Zealand', *Economic Record*, December, p. 228.

<sup>89</sup> Compare eg. Singleton p. 97, Greasley and Oxley, p. 698.



"Our Financial Stork" – how cartoonist J. C. Hill (d. 1957) saw the arrival of the Reserve Bank. (Auckland Star)

## 5 Towards policy stability 1934–36

Establishment and early Reserve Bank operations during 1934 did not end debate over the decision to set up a central bank, either at policy-making or at more general popular level. Public and sectoral responses were significant. In some quarters there was concern about the apparent final removal of the gold standard. In other quarters, including the farming sector, there was concern that the establishment of the Reserve Bank would mean a return to sterling parity. A range of aspirations and fears were clearly still in play, and Coates felt impelled to issue a new pamphlet in December 1933, 'The Reserve Bank of New Zealand and the gold question'. Here he noted that:

*The establishment of the Reserve Bank does not mean that New Zealand will be on the gold standard, or on the gold-exchange standard. Nor does it mean that it will be bound to sterling at any fixed and unalterable ratio...*<sup>90</sup>

This did not quell the policy arguments, which resumed even before the Bank was open for business. In February 1934, the Government appointed a multi-party committee

<sup>90</sup> J. G. Coates (1933b), 'The Reserve Bank of New Zealand and the gold question', Wellington, December, p.1



*The Reserve Bank Board of Directors, 1934–35. Leslie Lefaux sits centre frame. (Reserve Bank of New Zealand)*

under Palmerston North MP J. A. Nash to look into monetary systems, standards and relationships. Members were drawn from both sides of the House and included W. Downie Stewart, with 'expert Secretariat' support from Bernard Ashwin and William Sutch. The Associated Banks, The Treasury and leading economists A. H. Tocker, Horace Belshaw and D. O. Williams were invited to give evidence.<sup>91</sup>

The committee thus reflected some of the most significant expertise in the field of economics that New Zealand could muster at the time. Their undeclared but overt motive was silencing the voices of the Douglas Credit movement; the committee paid special attention to the idea, even quizzing Douglas, who happened to be in the country at the time. They found no basis in his theories.<sup>92</sup> Instead, after receiving 98 submissions and advice from The Treasury, the committee concluded that Douglas Credit was dangerously inflationary, and supported stabilising the New Zealand pound at the 125:100 ratio.<sup>93</sup> This drew attention in Britain; and leading economist John Maynard Keynes concurred with

the conclusion that there was nothing to be gained from inflationary proposals.<sup>94</sup>

However, members were far from unanimous; the three Labour members and one Independent then issued a memorandum stating their dissent, and Downie Stewart refused to sign.<sup>95</sup> The dissenting view was that a 'complete reconstruction of the monetary system of the Dominion' was 'essential'. The Reserve Bank, in its 1933 incarnation, was thought inadequate because it was likely to continue the sterling balance system.<sup>96</sup>

This was broadly indicative of the fact that the Reserve Bank's role and function underwent ongoing consideration even after the organisation was founded, of the degree to which opinion remained divided, and of where the dividing lines sat. Labour was one of the more crucial voices. They were influenced by Douglas Credit, and members continued to argue fundamental matters of Reserve Bank function and control even after the Reserve Bank began operations

<sup>91</sup> AJHR 1934 B-3 'Report of the Monetary Committee', p.3.

<sup>92</sup> *Ibid.*, p. 60.

<sup>93</sup> See, eg, *ibid.*, pp. 71, 75

<sup>94</sup> J. M. Keynes (1935), 'Report of Monetary Committee, 1934, New Zealand', *The Economic Journal*, 45 (177), p. 194.

<sup>95</sup> Chappell, p. 330.

<sup>96</sup> AJHR 1934 B-3 'Report of the Monetary Committee', pp. 86–87.



W. F. L. Ward, Deputy Governor of the Reserve Bank 1934–40. Ward was appointed Acting Governor on Lefeaux's departure, but not appointed Governor immediately because of his age. He held the acting role until 1944, when he was finally appointed Governor, a position he held until his death in 1948. Portrait by Archibald F. Nicoll. (Reserve Bank of New Zealand)

on the Coates model.<sup>97</sup> There was nothing new about these differences; the issue had been well aired in the 1933 parliamentary debate, and was couched around the suggestion that the Reserve Bank Bill failed to 'establish the sovereignty of the people and of the Parliament of New Zealand over the Dominion's credit resources', failed to provide mechanism for 'credit and currency' to be available for social services, and failed to 'provide the means of increasing the purchasing power of the wage-earners, farmers, unemployed workers, and the useful people of the community generally'.<sup>98</sup>

To this extent the policy arguments associated with the Reserve Bank's establishment in the early 1930s remained unresolved, essentially because the visions still conflicted. This was academic when the United-Reform coalition was in power, but Labour won more than 70 per cent of the seats in the 1935 election, and the government of Michael Joseph Savage had every intention of realising its own concept of a central bank. The importance it placed on this issue was

underlined by the fact that the Reserve Bank Amendment Act 1936 headed Labour's legislative programme for the year. Although called an 'amendment', this legislation actually introduced a number of fundamental shifts in the Reserve Bank's basis of establishment, function and operation. It nationalised the organisation completely, provided more scope for the Bank to extend credit to government and government agencies, and added a power that allowed the Reserve Bank to vary the reserve requirements on banks – something that became the principal tool for active monetary management in the post-war period. The amendment also brought the operation of the Bank under more overt political control.<sup>99</sup> As Sutch put it:

*The Reserve Bank now has the power to underwrite Government loans, to extend long-term loans to the Government and to advance to the Government moneys on overdraft for the purchase and marketing of any New Zealand product. The Bank is directed to control all foreign exchange funds resulting from New Zealand's exports and also the transfer of overseas funds to and from New Zealand. Power is also given to prevent, if necessary, the automatic convertibility of Reserve Bank notes into sterling. The Government would therefore, if the occasion arose, be able to stop a flight of capital or ration imports.*<sup>100</sup>

In some respects this incorporated the ideas of the 1934 monetary committee, but more particularly it brought the Bank into line with Labour's ideas of economic management, which Walter Nash had enumerated in the 1920s.<sup>101</sup> To this extent the Amendment Act was not post-fact tinkering, or adaptation to changing circumstance, but a direct extension of the original policy debate; and as Sutch has also observed, it was consistent with the Labour Party's principles of the day.<sup>102</sup> Coates' approach had lasted less

<sup>97</sup> Hawke (1973), p. 61.

<sup>98</sup> NZPD Vol. 236, p. 797.

<sup>99</sup> "Reserve Bank of New Zealand (1955), *Monetary and Fiscal Policy in New Zealand: submissions to the Royal Commission on Monetary, Banking and Credit Systems 1955*, Reserve Bank of New Zealand, Wellington, p.8

<sup>100</sup> Sutch, *Recent Economic Developments*, pp. 34-35.

<sup>101</sup> NZPD, 'Reserve Bank of New Zealand Amendment Bill, 1936, Parliamentary Debate; 2nd and 3rd readings, p. 143.

<sup>102</sup> Sutch (1966), *The Quest for Security in New Zealand, 1840-1966*, pp. 206–207.



*Permanent premises eluded the Reserve Bank for nearly 40 years, although efforts were made to obtain such from the outset. Architects Mitchell & Mitchell were commissioned to design a head office in 1935. The concept pictured here was developed in 1943-44. (Reserve Bank of New Zealand)*

than two years. It was a significant change. Sutch argued that no real difference was expected at daily operational level. 'In practice it is expected that the Reserve Bank will operate very much as the Commonwealth Bank of Australia (also a State institution) by being the ultimate repository for the overseas funds of the trading banks'.<sup>103</sup> In practise, Labour's amendment had a number of direct longer-term effects. One structural outcome was that it helped transition New Zealand into an inflationary regimen by drawing the Reserve Bank into the world of state housing finance and a guaranteed pastoral price scheme. The practical result was an increase in money supply, and a depletion of the overseas sterling reserve by some 60 per cent by December 1938.<sup>104</sup>

These amendments brought the Government into conflict with the Governor; Lefeaux expressed his opposition to the 1936 change and continued to operate as if the Reserve Bank did have a degree of policy independence. As Hawke has observed, Lefeaux's attitude prompted the Government

to amend the legislation slightly in 1939, putting the Bank more explicitly under control of the Minister of Finance.<sup>105</sup> In practice this amendment had the appearance of an effort to rein in the Governor; and the dissonance of views was arguably also a factor in the Government decision not to reappoint Lefeaux when his seven-year term expired in 1940. He was instead offered an acting position, and chose not to take it.

In the widest historical context, however, there was nothing particularly radical about what Labour was doing. Although New Zealand's incarnation was somewhat ahead of the general curve, the early-to-mid twentieth century was the age of activist government and of the economic policies of John Maynard Keynes. This was ultimately expressed in both left and right flavours. Although Labour's 1936 amendment diverged from the initial policy concept of the Reserve Bank, and although radical thinking about money – including Douglas Credit – remained influential in the Labour party, the key movers-and-shakers of the mid-1930s – Nash,

<sup>103</sup> Sutch (1936), *Recent Economic Developments*, p. 35.

<sup>104</sup> Greasley and Oxley, p. 710.

<sup>105</sup> Hawke (1973), p. 62, 65.

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Peter Fraser and Robert Semple – represented the more conservative arm. By the 1930s, the centre of gravity in policy debates, even on the left, lay in the detail of control versus free market, not in the replacement of capitalism. Greasley and Oxley have also argued, by counter-factual exercise, that the policies Labour adopted for the Reserve Bank in 1936 may have helped bolster a startling acceleration of recovery in GDP, more so than if these policies had not been adopted. This was, they suggest, a ‘striking testimony’ to the ‘force of the new [economic] regime’ as well as the ‘decisive’ importance of the Reserve Bank within it.<sup>106</sup>

From a broad policy perspective, then, the conceptual development of the Reserve Bank spanned the years 1920–36, driven in the last phase by political imperative, after which there was a period of overall policy stability towards the Reserve Bank and its expected functions. This – in general terms – matched the worldwide ‘age of big government’; and while the specific New Zealand experience of the period can be considered ahead of the curve at times, it was otherwise broadly unexceptional.

## 6 Summary and conclusions

The debate over the origins of the Reserve Bank makes clear that the primary policy considerations were founded in the context of New Zealand’s early twentieth century economic and banking history in general, and a response to immediate depression emergency in specific. In the context of the British push to get its Dominions to establish central banks, New Zealand’s timing was unexceptional. Australia set up a central bank of sorts with the Commonwealth Bank as early as 1911; South Africa established a central bank in 1920, Canada matched New Zealand in 1934; and India followed in 1935.<sup>107</sup>

The ground moved markedly in the course of the period that is the focus of this article, broadly 1929–1936. Early in the period, orthodox advocates of the central bank, including The Treasury, saw it more as responding to longer-term pressures that were apparent prior to the depression. These included the long-standing case for a single New Zealand currency,

established on a sound footing and independent both of Australia and of routine political pressure, supporting the exchange rate parity with the United Kingdom. An agency of this sort was seen as independent of political pressure, and able to put New Zealand’s monetary management in a position where it was also independent of the situation across the Tasman.

While much of the immediate policy debate behind the 1933 legislation was conducted during the depression years, there is no evidence that a central bank was seen among Wellington policy makers as a sole or specific means of lifting New Zealand out of economic gloom. However, the depression did trigger a more activist approach to economic management in general, and in particular it led to a decisive departure from exchange-rate parity and to a nascent sense of exchange-rate policy.

Although post-dating the establishment of the Bank, the 1936 amendments must be considered an integral part of the process that led to New Zealand’s decision to adopt a central bank in the first place, because the Labour party of Michael Joseph Savage considered the business unfinished, and proceeded to amend the control and function to suit its own more activist state-oriented vision when it came to power.

This highlights one historical issue. Niemeier’s advice to create a politically independent organisation was overtaken from the mid-1930s by the tides of general political, social and economic change, factors ultimately affecting parties of both left and right in New Zealand. Yet the notion was not forgotten. A considerable measure of operational independence, balanced by an extensive accountability regime, was finally achieved in the late 1980s, albeit amid a very different context from the one that had led to the Bank being opened in the early 1930s.

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<sup>106</sup> Greasley and Oxley, p. 716.

<sup>107</sup> Singleton, p. 10.

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# Modelling New Zealand inflation in a Phillips curve<sup>1</sup>

David Hargreaves, Hannah Kite and Bernard Hodgetts

This article presents some simple estimates of Phillips curves for New Zealand inflation and outlines a recent reorganisation of the inflation process in the Reserve Bank's Forecasting and Policy System (FPS). While modern economic theory suggests the traditional Phillips curve should be used only with care, empirical estimates for New Zealand suggest it continues to have some value. We find that estimates of the impact of resource pressure (the "output gap") on inflation are easiest to obtain from an equation on the non-tradables component of CPI inflation, and show that this relationship can be improved statistically by introducing a (fairly smooth) measure of inflation expectations on the right hand side. We present some evidence that the relationship between resource pressures and non-tradables inflation is stronger in New Zealand than some comparable countries, and further evidence that this could be related to the cyclicity of housing construction costs in New Zealand. In the latest version of the Reserve Bank's macro-model, FPS, the inflation process has been written with a tradables/non-tradables split and an explicit empirical measure of inflation expectations. This does not greatly change model properties but allows the model's congruence with the data to be assessed more directly.

## 1 Introduction

A central bank charged with controlling inflation needs to monitor and understand the inflation process within its economy. Building up a view of the determinants of inflation will typically involve a range of statistical techniques and economic theories.

While the Reserve Bank takes an eclectic approach to thinking about the possible causes of inflation, the Bank's core model of the economy (the Forecasting and Policy System or FPS) focuses on a fairly simple story of inflation determination, the so called "Phillips curve" which relates inflation to measures of resource strain in the economy.

A recent article in the *Bulletin* (Hodgetts, 2006) described some changes in New Zealand's inflation process over the past 20 years. This article builds on that discussion by providing more details on the Phillips curve structure in use within FPS, which has recently been altered significantly to allow better monitoring of the inflationary process. We begin by discussing the ideas and history behind the Phillips curve and some recent related theoretical developments in section 2. In section 3, we describe some representative Phillips curves estimated on New Zealand non-tradables and

tradables inflation data, showing a significant relationship between non-tradables inflation and resource pressure. We show that this relationship looks more reliable in New Zealand than in some other countries, and consider further why this might be the case. In section 4 we describe how this evidence has been calibrated into the most recent version of FPS.

## 2 Some history of the Phillips curve and recent developments

The simplest Phillips curve, which Bill Phillips, a New Zealand economist, sketched around 1958, showed an empirical inverse relationship between inflation and unemployment "in the previous 90 years or so of United Kingdom data" (Laidler, 2001). The curve has attracted a lot of fame and notoriety ever since.

The notoriety of the Phillips curve came about because of the risk that it might be interpreted as a potentially exploitable relationship for policy purposes. A possible interpretation of the curve was that lower unemployment could be permanently achieved at the cost of a higher (but stable) rate of inflation. However, as shown by Milton Friedman and others, this depended on the assumption that inflation expectations would remain stable as inflation rose. If inflation expectations instead responded gradually (adaptively) to

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<sup>1</sup> In places this article draws on internal work by other Reserve Bank staff including Andrew Binning, Leni Hunter and Ashley Lienert. Additionally, the authors thank Felix Delbruck, Yuong Ha, Tim Hampton and Christie Smith for useful comments.

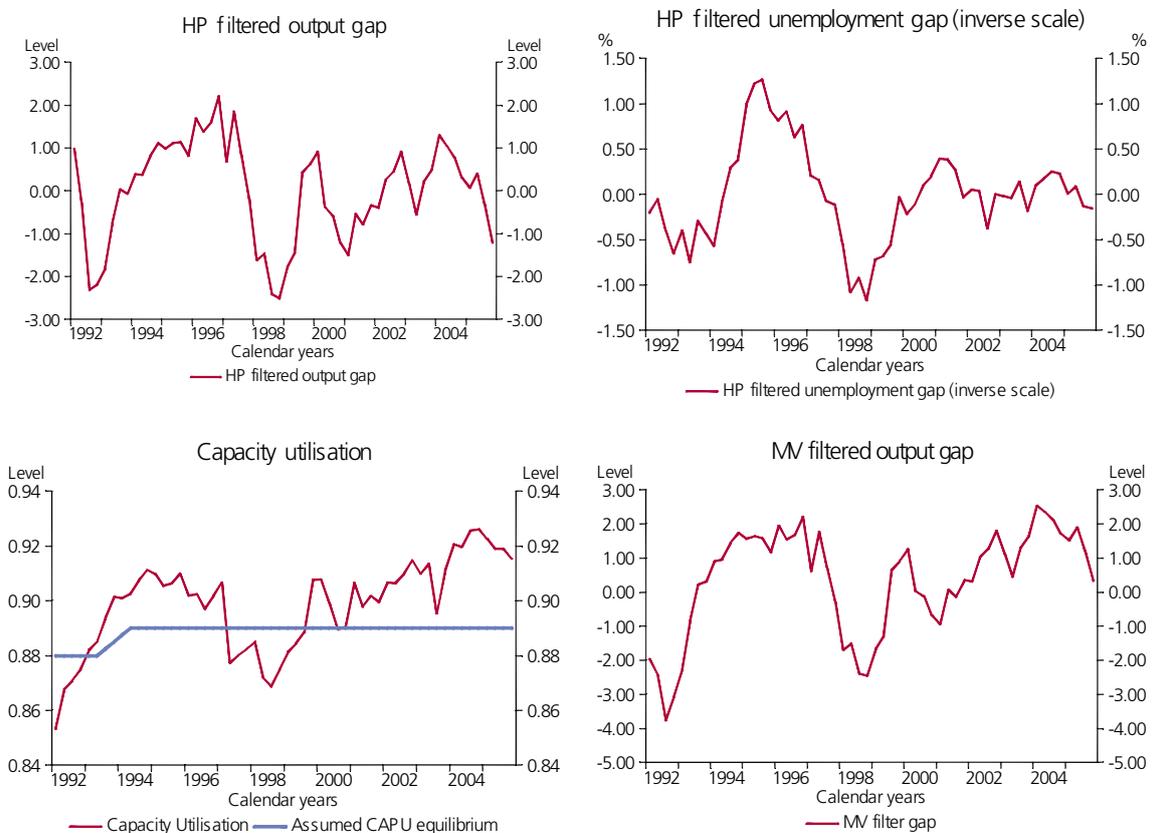
rising inflation, there would only be a temporary reduction in unemployment unless the central bank was prepared to tolerate steadily increasing rates of inflation.<sup>2</sup>

Friedman's critique of the exploitability of the Phillips curve was not the end of the controversy. The rational expectations revolution in economics in the 1970s introduced the idea that inflation expectations might respond instantly to the prospect of higher inflation, meaning that predictable monetary policy actions would essentially have no influence on economic activity. This was followed by work showing that providing there are "frictions" that slow down price adjustment, monetary policy could still exert an influence on the real economy, and demand cycles could still generate inflation, even if expectations were rational. These new generation models of inflation, known as "Dynamic Stochastic General Equilibrium" (DSGE) models, are now

being developed as policy and forecasting models in central banks and elsewhere.

As discussed in Box 1 (p. 28), several countries have found that the empirical relationship between traditional measures of excess demand in the economy and inflation has weakened considerably over the past decade or so. Nevertheless, the Phillips curve remains near the centre of policy analysis in most inflation-targeting central banks, but typically in a quite different form from Phillips' original empirical construct. Firstly, there is usually a measure of inflation expectations included in the relationship instead of a constant. This might be a survey-based measure of inflation expectations, a lag of inflation, or something more sophisticated. Secondly, Phillips curves now typically use something other than the unemployment rate as a measure of "inflationary pressure".

**Figure 1**  
**Measures of excess demand in New Zealand**



<sup>2</sup> Laidler (2001) notes that Bill Phillips was entirely aware that all he was showing was demonstrating an empirical relationship, and documents substantial discussions between Friedman and Phillips that followed.

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One concept sometimes used in the Phillips curve is the so-called “output gap”: the difference between actual output and a measure of “potential” output. Conceptually, potential output is intended to mean the level of output which does not generate upward or downward pressure on inflation. One traditional measure of the output gap can be obtained by running some sort of statistical smoother (or filter) through output, to obtain a rough measure of potential output. The implicit assumption is that the supply side of the economy evolves in a fairly slow and regular fashion, while deviations of output from that smooth trend are driven mostly by demand shocks that will tend to generate inflation. At the Reserve Bank, we use a measure of the output gap that augments this simple filter with other information. This “multivariate” (or MV) measure of potential output has been described in Conway and Hunt (1997), Citu and Twaddle (2003), and Graff (2004). Matheson (2006) is a recent statistical study of New Zealand inflation that shows the output gap is a useful statistical predictor of non-tradables inflation.

Figure 1 shows some of the inputs used to create the MV measure of the output gap, as well as showing the MV gap itself (on the bottom right). A simple statistical filter measure of the output gap (the top left) is combined with other inputs including a statistically detrended unemployment rate (top right) and the level of capacity utilisation (bottom left)<sup>3</sup>. These different measures of pressure on resources are all fairly correlated with each other, with simple correlation coefficients between 0.5 and 0.8.

The Reserve Bank’s main macroeconomic model, FPS, includes a Phillips curve for the determination of inflation (see Black et al 1997). This is part of a set of calibrated dynamic relationships that are not generally derived from formal microfoundations, but are designed to be consistent with the Bank’s view of how the economy works. For example, FPS implies that the peak effect of changes in export prices on export volumes takes around six quarters. This reflects the view, backed up by empirical evidence collected over the years, that New Zealand’s commodity exports cannot

be expanded quickly because of agricultural constraints. We have not gone further and explicitly modelled those agricultural constraints, as we would do if we were trying to incorporate them in a fully structural (eg DSGE) model. It may therefore be more appropriate to describe the FPS inflation system as “semi-structural” when comparing it to some of the DSGE models that are beginning to be implemented in other countries.

We have already discussed the importance of including a measure of inflationary expectations as a driver of inflation in a (structural or semi-structural) Phillips curve. In a fully structural model, this measure would be the “model consistent lead” or rational forecast of inflation; this basically means that in the absence of unforeseen events, the inflation expectations measure in the Phillips curve would be a correct forecast of next period’s inflation rate. Such a model would have a very forward-looking inflation process where future events can greatly influence inflation today. Many economists postulate rational expectations but assume that some “intrinsic lags” or impediments to the adjustment of prices make inflation partly backward-looking, creating the so-called hybrid Phillips curve which is used in FPS. In a hybrid Phillips curve, inflation is a function of inflation last period as well as forecast inflation next period, with the weights on these two factors summing to one. It is also possible to motivate this type of inflation process by assuming that some people are forming expectations of inflation adaptively, with reference to past inflation.

It is also important to examine the theoretical foundations behind the use of an “output gap” derived using a ‘smoother’. The case for this is informal rather than rigorously derived and has been criticised in some recent analysis (see for example Neiss and Nelson (2001) for a discussion). One line of criticism against a filtered output gap as an indicator of inflation is that there may be periods where sudden increases in GDP are caused by improvements on the supply side of the economy, rather than a sudden increase in demand. In this case, the sudden increase in output may be associated with a fall in inflation. A simple example would be an economy that only produced (and consumed) apples. During an excellent growing season, we would expect GDP (production of apples) to rise and the CPI (apple prices) to

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<sup>3</sup> The MV gap also uses survey information about the level of skill shortages, and the inflation rate. The mean level of capacity utilisation is assumed to have shifted after the early 1990s recession, as shown in figure 1.

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fall. If demand for apples was relatively stable, the quality of the growing season would be the key macroeconomic shock and the reduced form relationship between the output gap and inflation would be negative.

To explain why we think that the output gap may retain some validity in the New Zealand context, we can extend the analogy above to consider trade in commodities and non-tradable goods. Consider a small open economy which consumes a broad basket of goods, but imports almost all of them, and produces only apples and houses. Suppose again that the key macroeconomic shocks relate to the apple growing season. An excellent growing season will now produce an increase in GDP. But assuming the economy is a relatively small producer of apples internationally, apple prices will not fall significantly. Thus domestic farmers will receive higher incomes and be able to purchase or rent larger houses and import more imported goods. Assuming housing is a much more significant component of the domestic CPI than apples, we might expect the overall CPI to be rising. Thus the existence of supply shocks may not invalidate the output gap as an inflation predictor, if the main source of supply volatility is an export good. Since most of New Zealand's agricultural output is exported, agricultural supply shocks may create less difficulty for the output gap as an inflationary indicator than one might have thought.

Finally, other critics of the output gap note that it is subject to revisions as new information about the evolution of the economy becomes available. Thus as a "real time" measure of inflation pressures, the output gap could be seriously misleading, even if historical estimates track inflation well. This is definitely a potential source of difficulties when using the output gap to forecast inflation. However, Graff (2004) and Matheson (2006) find that real time output gap estimates have had some ability to predict inflation in New Zealand. Broadly, the Reserve Bank's approach has been to make use of frameworks where inflation is presumed to depend on pressure on resources (measured using tools like the output gap), but to complement those frameworks with a range of other statistical approaches to inflation forecasting, such as the so-called "factor models" discussed in Matheson (2005).

To summarise this section, while there have been a range of

theoretical challenges to the Phillips curve, we think that a Phillips curve that is augmented to include expectations and lags of inflation and a "multivariate" measure of resource pressure may remain useful in the New Zealand context. In the next section, we look at whether this view matches the data.

### 3 Modelling New Zealand inflation

The inflation process in New Zealand has obviously seen significant structural change: inflation was relatively low in general until the 1970s, then rose dramatically until the mid-1980s, fell during the disinflationary process after 1989, and has been relatively low and stable since approximately 1992. Given that we do not expect our approach to be robust to large structural changes, it seems prudent to do most of our estimation work over the period during which inflation has been low and stable, and we therefore restrict our statistical analysis to the period post 1992.

Another important issue to consider is the impact of the exchange rate on the behaviour of traded goods prices. When the exchange rate rises, there tends to be fairly quick pass-through into the price of traded goods in the New Zealand CPI. Because the exchange rate may change significantly from quarter to quarter, it is likely to be a key driver of traded goods inflation, which in turn may be quite volatile.

Consequently, it is important to include the change in the exchange rate in any reduced form Phillips curve for New Zealand CPI inflation, or account for it in some other way.<sup>4</sup> As in Matheson (2006), our approach is to disaggregate inflation into traded and non-traded goods, on the assumption that the traded component of the CPI incorporates the direct exchange rate effects. This approach enables us to separately track traded and non-traded inflation within our macroeconomic model. The idea that

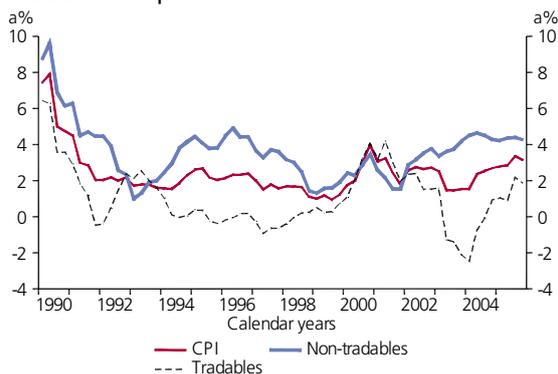
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<sup>4</sup> Some tests of the reduced form Phillips curve in New Zealand such as Razzak (2002) were constructed without an exchange rate term. This will reduce the power of the model and may lead to the output gap appearing to be insignificant when a model including exchange rate changes may conclude the opposite.

statistical models of the Phillips curve should focus on non-traded inflation (or alternatively a measure of core inflation) is common internationally.

The traded and non-traded components of CPI inflation in New Zealand since 1990, as well as aggregate CPI inflation, are shown in figure 2. The figure shows the fall in inflation during New Zealand's disinflationary period and the more stable rates of inflation that have prevailed since 1992. It is also interesting to note that, over the period since 1992, non-tradables inflation and tradables inflation have tended to be negatively correlated. Tradables inflation has a lower mean than non-tradables inflation over the period, and has also been a bit more volatile.

**Figure 2**  
Annual CPI inflation and the tradable and non-tradable components

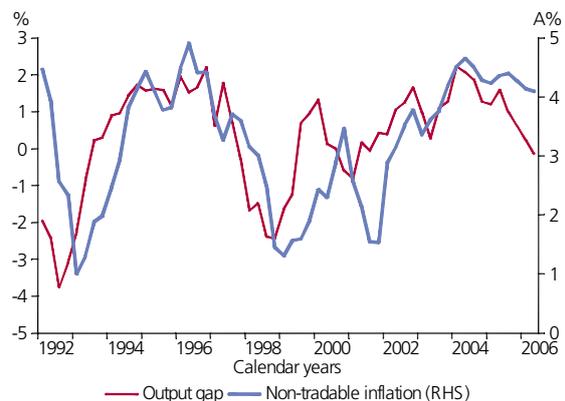


### (i) Modelling non-tradables inflation

Figure 3 shows the relationship between annual non-tradables inflation (defined as how much non-traded prices in a given quarter have changed compared to a year earlier) and the output gap lagged three quarters; the simple correlation coefficients between these variables is around 0.8. Figure 3 suggests that a 1 per cent increase in the output gap, all else equal, will lead to a roughly 0.6 per cent increase in annual non-tradables inflation. This relationship between excess demand and inflation in New Zealand is generally more robust than that found in other countries (see box 1, overleaf).

The quarterly non-tradables inflation series (defined as non-traded prices in one quarter compared to prices in the previous quarter) displays considerably more variability or "noise" than the annual inflation series. This increased

**Figure 3**  
Output gap and annual non-tradables inflation



variability means that the correlation between quarterly non-tradables inflation and the output gap is lower (around 0.6). However, for the purposes of FPS, we need equations for the quarterly inflation rate in tradables and non-tradables, so our calibrations have been based on some fairly simple quarterly regressions.<sup>5</sup>

In table 1 on p. 29, we present a range of estimated equations modelling quarterly non-tradables inflation. The first equation (specification 1) models non-tradables inflation simply as a function of its own lag. The second equation (specification 2) introduces the lagged output gap. The output gap is highly significant and its introduction drives the estimated value of the lagged inflation term to near zero, suggesting that as a purely empirical matter it is reasonable to model non-tradables inflation as being driven by the output gap and a constant.

However, in the introduction we discussed reasons why an equation relating inflation to the output gap and a constant cannot be seen as a structural relationship. There are a number of economic interpretations of the fact that a Phillips curve with a fairly constant term as a proxy for inflation expectations fits reasonably well in this context. Most obviously, actual inflation has not varied greatly over the sample period over which the equations have been estimated, suggesting that expectations may not have shifted markedly. More generally, if expectations are fully rational, but inflation is quite difficult to forecast, the rational one period ahead forecast of inflation may be roughly constant.

<sup>5</sup> We hope to produce further technical details on the model recalibration in a future discussion paper.

## Box 1

### Inflation and excess demand and supply in other countries

In New Zealand, the relationship between various measures of excess demand (such as the capacity utilisation reported by firms and the output gap) and the non-tradable component of CPI inflation appears to have endured over the past decade; the relationships between these excess demand measures have also been relatively stable over time.

However, in a number of countries the relationship between excess demand and inflation has weakened since the mid-1980s and, in some cases, has become very difficult to detect. Melick and Gelati (2006) report findings for a range of countries of a breakdown in the statistical relationship between the output gap and inflation over the past decade or so. A number of other studies have also found that the relationship between measures of capacity utilisation and inflation has deteriorated, with the most convincing evidence coming from Canada, the US, and a range of European countries.<sup>6</sup>

A number of possible explanations have been posed (and debated) for the deterioration of the excess demand-inflation relationship, including:

- the increased openness of national economies.
- technological developments;
- the increasing size of the services sectors within national economies; and
- the improved conduct of monetary and fiscal policy.

Increased openness has two possible effects that may reduce inflationary pressures in times of high capacity utilisation. First, a high level of external trade increases competition, leading to downward pressure on prices of domestically produced goods, even in times of high domestic capacity utilisation. Second, in an open economy cheaper goods may be more easily sourced from foreign producers at times of high domestic capacity utilisation, thereby muting the inflationary effect. In support of this explanation,

<sup>6</sup> These studies tend to look at the relationship between capacity usage and aggregate CPI inflation (and not narrower inflation measures, such as non-tradables). However, when we have looked internally at the international data using services CPI (a proxy for non-tradables) we find similar conclusions.

Borio and Filardo (2005) find that the importance of global factors has increased relative to domestic factors in explaining inflation for a sample of 16 countries.

Technological change is another explanation put forward for a breakdown in the capacity-inflation relationship in the literature. New technologies may enable less skilled workers to perform tasks that previously required skilled workers, decreasing the marginal costs faced by firms under 'high' rates of capacity utilisation and thus reducing any inflationary pressures.

Another argument made in the literature is that the relative importance of the manufacturing and industrial sectors continues to decline as the services sector becomes bigger. This may render some traditional metrics of the economic cycle, such as capacity utilisation, a poor indicator of inflation.

Some researchers have also suggested that the improved conduct of fiscal and monetary policies over the past 15 years may have reduced the volatility of inflation and output (and the output gap) to an extent that the drivers of inflation are simply harder to detect statistically.

The findings and arguments in the literature pose a puzzle for New Zealand. If the explanations are valid, why has the excess demand-inflation relationship broken down in some other countries, but not in New Zealand? New Zealand is an open economy facing international competition and largely has access to the same production technologies as foreign producers. New Zealand's services sector has also been getting bigger over time. Likewise the amplitude of cycles in inflation and output in New Zealand has reduced in recent years.

The very dominant role the housing sector seems to play in shaping the New Zealand inflation cycle may account for some of the discrepancy. The housing component has dominated movements in non-tradables inflation over the past 10 years and is also closely correlated with measures of the economic cycle. When housing is removed from non-tradable inflation, the strong relationship between capacity utilisation and inflation deteriorates quite markedly, although a relationship can still be detected. The role of housing in the relationship between inflation and the economic cycle in New Zealand is discussed in more detail in box 2.

**Table 1**  
**Equations modelling quarterly non-tradables CPI inflation**  
*(Sample period is 1992q1 to 2005q4, 56 observations)<sup>7</sup>*

Equation variables	(1)	(2)	(3)	(4)	(5)
Constant	0.52 (.11)	0.73 (.11)	0.74 (.20)	0.33 (.32)	.24 (.04)
Inflation expectations or lagged inflation <sup>8</sup>	0.36 (.13)	0.04 (.14)	0.02 (.36)	0.82 (.62)	1.0 (restricted)
Output Gap (first lag)		0.14 (.04)	0.15 (.03)	0.14 (.03)	.14 (.03)
Diagnostics					
Adj R-squared	.11	.30	.30	.32	.34
Durbin Watson	na	na	1.81	1.83	1.82
Akaike I.C.	.87	.64	.64	.61	.58

Another possibility is that the output gap is a useful proxy for the component of inflation that is able to be forecast, so that the coefficient on the output gap in the equation is partly driven by the influence of the output gap on inflation expectations.

We look at this further in specifications 3 to 5 by incorporating two alternative measures of inflation expectations derived from a Reserve Bank survey. We look at expected inflation in the next quarter in specification 3. Simple microfounded models suggest that this is the appropriate measure to use in the regression. However, the measure has a coefficient very near zero and is statistically insignificant from zero, leading us to also investigate longer horizon measures of inflation

expectations. These measures turn out to improve the fit of the regression and have significantly larger coefficients. We searched over a range of surveys and lags, but ultimately settled on the surveyed expectation of annual inflation two years ahead, entering the regression with a two quarter lag. In specification 4, this gets a coefficient of .82, close to the value predicted by theory, which is 1. In specification 5 we restrict the coefficient on that measure of expectation to equal 1.

We have used the first lag of the output gap in the equations above. However, the output gap is serially correlated, making it hard to identify the precise lags with which it influences quarterly non-tradables inflation. The strongest simple correlations are between inflation and either the contemporaneous output gap or the first lag. In table 2 we investigate the consequences of using a contemporaneous term, and we also look at empirical estimates of the asymmetric Phillips curve, where positive output gaps are able to influence inflation more than negative output gaps.

Our results suggest that the contemporaneous and first lag of the output gap fit approximately equally well (comparing specifications 5 and 6), and in the final model specification

<sup>7</sup> Technical note: the number in brackets after each regression coefficient is the standard error of the coefficient. To interpret this, note that we can be fairly confident the true coefficient is not more than 2 standard errors from the estimated value in the table. The Adjusted R-squared and Akaike Information Criteria (AIC) are measures of how well the equation summarises the data. A higher R-squared and lower AIC suggest better fit. The Durbin-Watson is a test for serial correlation in the equation's errors. It should not be conducted if there is a lagged dependent variable, and is omitted from the reporting of those regressions. The other non-tradable regressions do not appear to exhibit serially correlated errors.

<sup>8</sup> Specification 3 uses the Reserve Bank survey of expected quarterly inflation next quarter. Specifications 4 and 5 use the second lag of the Reserve Bank survey of expected annual inflation in two years time. In specifications 1 and 2, lagged quarterly non-tradable inflation is used rather than surveyed inflation expectations.

Table 2

Non-tradables inflation with an expectations term and different output gap lags<sup>9</sup>  
 (sample period is 1992q1 to 2005q4, 56 observations)

Equation variables	(5)	(6)	(7)	(8)
Constant	.24 (.04)	.23 (.04)	.16 (.07)	.20 (.09)
Output gap		.15 (.03)		.08 (.08)
Output gap (first lag)	.14 (.03)		.10 (.04)	.06 (.06)
Output gap (positive values only)			.12 (.09)	.05 (.11)
Diagnostics				
Adj R-squared	.34	.36	.35	.35
Durbin Watson	1.82	1.76	1.85	1.81
Akaike I.C.	.58	.54	.57	.59

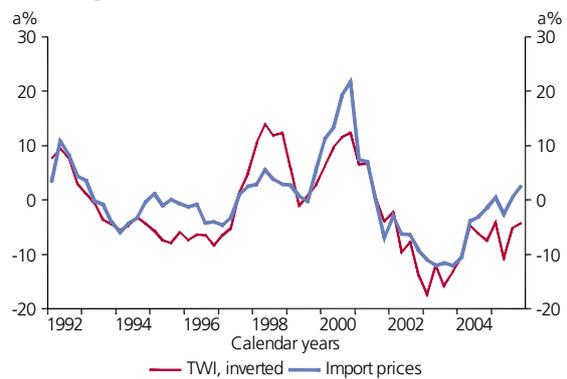
we include both.<sup>10</sup> We find only weak evidence of an asymmetry in the Phillips curve (with the coefficient on the positive values of the output gap positive, but not statistically significant), but choose to retain it. Asymmetry in the model makes the risk of inflation spiralling upward slightly greater than the risk of a deflationary spiral. The underlying idea behind the asymmetric Phillips curve is discussed further in Black et al (1997).

**(ii) Modelling tradables inflation**

We now repeat a selection of the equations estimated above on non-tradables inflation to model tradables inflation. The key difference is that in every tradables regression we also include the change in domestically denominated import prices (as measured by Statistics New Zealand’s Overseas Trade Indices). Figure 4 below shows that this series is substantially explained by the change in the value of the

New Zealand dollar (measured using the trade weighted index). In the results reported below we use the annual change in import prices to model quarterly inflation.<sup>11</sup>

Figure 4  
 Annual percent changes in import prices and the Exchange rate



<sup>11</sup> A search over unreported specifications showed that using the contemporaneous annual change in import prices produced the best fit. Since taking annual changes induces a lag, this specification implies that the average lag between import price changes and the impact on the CPI is around 1.5 quarters. To see this, note that the annual change is the sum of the current quarterly change and the three previous quarterly changes. Implicitly we are restricting these four quarterly changes to have the same coefficient, a restriction which is not rejected by a joint F test (p value = .24).

<sup>9</sup> Specifications 5 through 9 include the second lag of the Reserve Bank survey of expected annual inflation in two years time, with a coefficient restricted to equal 1.

<sup>10</sup> With a contemporaneous output gap, there are endogeneity issues – it is in principle possible that inflation is causing the output gap rather than the other way around. This is a reason for caution regarding the precise estimates obtained using the contemporaneous gap.

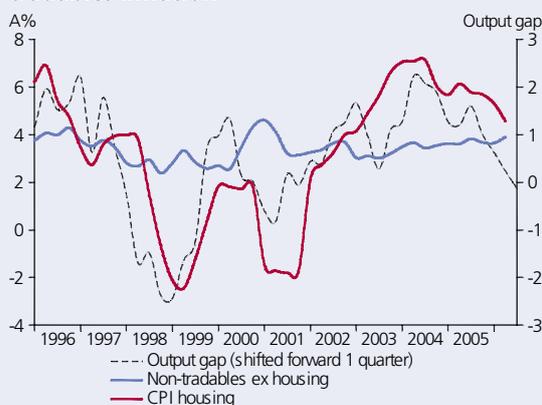
## Box 2

### Housing and non-tradables inflation

The finding of a stable relationship between non-tradables inflation and the output gap in New Zealand has prompted the Bank to look closely at which components of non-tradables inflation drive the relationship. This work has revealed that the cycle in non-tradables inflation is basically made up of two sub-cycles: the cycle in housing inflation and the cycle in non-housing non-tradables inflation. In each case, the relationship to the output gap is different.

Figure 5

### Housing and non-housing components of non-tradables inflation



As shown in figure 5 the housing component of non-tradables moves closely with the economic cycle (as measured by the output gap). On a more detailed level, it can be seen that the correlation is driven by the construction costs component (approximately 50 per cent of the housing component by weight), and to a lesser extent the rental price component (about 30 per cent). These components tend to exhibit a much larger cycle than other components of the CPI, and are also closely correlated with the economic cycle. The inclusion of a measure of construction costs in the New Zealand CPI is relatively unique; aside from Australia, we are the only country to include such a measure.<sup>12</sup> In addition, the rental component in New Zealand has been considerably more cyclical in the past compared to the relatively subdued rental series in other countries such as Australia. The

<sup>12</sup> Most other countries use a rental equivalence approach to measuring housing in the CPI. To date there is no international consensus regarding the best way to measure housing in the CPI.

reason rentals have closely followed construction costs is because prior to 2001 the survey they were based on focused on new rents; since this time a matched sample has been used and the cycle in rentals has been considerably less pronounced.<sup>13</sup> Nonetheless, because of their large weight in the CPI, and strongly cyclical behaviour, construction costs tend to have a dominating effect on non-tradables inflation; and it is this component that drives the relationship between non-tradable inflation and the economic cycle in New Zealand.

But what about the non-housing components of non-tradables inflation? The Bank has found that there is a statistical relationship between the non-housing components of non-tradables and the economic cycle; however, this relationship is more muted and occurs with a relatively long time lag.<sup>14</sup> Most of the non-housing components are services (such as childcare and haircuts) and tend to be quite highly labour-intensive. Thus, the delayed effect of the economic cycle on the non-housing components could be the result of a wage effect, wages (and the inflation expectations that drive them) being slower to respond to the economic cycle than the housing market. On closer analysis we find that wages do lead changes in non-housing non-tradables inflation, and in turn wages are closely related to measures of capacity pressures (such as skill shortages) with a long time lag – this finding explains the more delayed link between the economic cycle and non-housing components.

One implication of this analysis is that following periods of high resource utilisation or capacity pressures, we may observe housing inflation falling relatively rapidly as capacity pressures ease, but non-housing inflation showing greater persistence. The recalibrated FPS exhibits similar dynamics, because non-tradables inflation has an immediate response to the output gap, then a secondary response which is caused by an increase in the model's measure of inflation expectations.

<sup>13</sup> Over time this may result in a less pronounced inflation cycle within the housing group.

<sup>14</sup> The best relationship is achieved when capacity utilisation (or the output gap) is lagged by around six quarters.

Table 3

## Tradables inflation specifications

*(Sample period is 1992q1 to 2005q4, 56 observations)*

Equation variables	(1)	(2)	(3)	(4)	(5)
Constant	.25 (.07)	.23 (.07)	-.51 (.30)	-.31 (.06)	-.31 (.05)
Inflation expectations or lagged inflation <sup>15</sup>	-.11 (.12)	-.10 (.12)	1.39 (.91)	1.0 (restricted)	1.0 (restricted)
Import prices (annual % change)	.053 (.01)	.057 (.01)	.055 (.009)	.055 (.009)	.056 (.009)
Output gap		.042 (.05)	.048 (.04)	.047 (.04)	.13 (.09)
Output gap (first lag)					-.08 (.08)
Diagnostics					
Adj R-squared	.33	.32	.34	.35	.35
Durbin Watson <sup>16</sup>	na	na	2.46	2.44	2.48
Akaike I.C.	1.42	1.44	1.41	1.38	1.40

The coefficients of around 0.05 on the annual change in import prices imply that a 1 per cent change in import prices pushes up tradables inflation by around 0.2 per cent and CPI inflation by around 0.1 per cent. This is a much lower effect than one would expect based on the share of imported goods in consumption, which is closer to 25 per cent than 10 per cent. The lower coefficient suggests some firms delay passing on rises in the costs of imports. Hampton (2001) finds a larger elasticity than in our study, but we are estimating a response to cyclical changes in import prices, whereas Hampton is estimating the long-run impact of changes in import prices. One would expect a cyclical elasticity to be lower if firms tend to delay price increases until they are sure that the rise in import prices will endure.

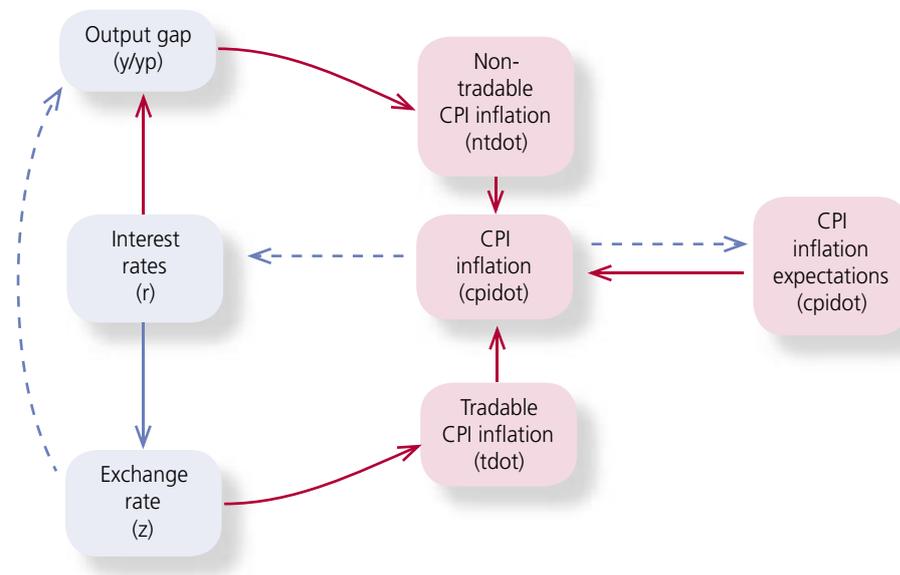
The output gap appears to have a mild influence on measured tradables inflation (although it is not statistically significant). The idea that the output gap can influence tradables inflation is plausible given that a lot of non-tradable resources are involved in distributing and retailing tradable goods within New Zealand. For example, a t-shirt is a tradable good, but when it is purchased in a New Zealand retail store, a lot of fixed New Zealand resources (such as warehouses, and the retail premises) have been used to get it to the final consumer. This suggests that pressure on New Zealand resources can influence the domestic price of imported goods sold here. For this reason we retain the contemporaneous output gap in our model even though the statistical significance is weak.

We find that the first lag of tradables inflation is statistically insignificant, suggesting that it does not systematically contribute to inflation expectations and the setting of tradable prices. Instead, we find that including a longer horizon measure of inflation expectations (the same one used in the non-tradables equation) improves the

<sup>15</sup> Specifications 3, 4 and 5 use the second lag of the Reserve Bank survey of expected annual inflation in two years time. In specifications 1 and 2, lagged quarterly tradable inflation is used rather than surveyed inflation expectations.

<sup>16</sup> Specifications 3, 4 and 5 use Newey-West standard errors to correct for apparent negative autocorrelation.

Figure 6  
New inflation nexus in FPS



regression fit. The coefficient on this expectations term is statistically insignificant from 1 and we restrict it to equal 1 in specifications 4 and 5. There is a negative constant in the regression after including the two-year ahead inflation expectations with a coefficient of 1, reflecting the fact that traded inflation has on average been significantly lower than overall CPI inflation.

The fact that the exchange rate seems to be important in the determination of tradables inflation may be one reason why tradables and non-tradables inflation have tended to be negatively correlated. When the economy is strong and recording positive output gaps and high non-tradables inflation, the currency has tended to be rising (pushing down tradables inflation).

#### 4 Building our empirical results into FPS

In the final section of this paper we describe the equations we have recently calibrated into FPS for tradables and non-tradables inflation, and inflation expectations. We then do a model simulation to show how the new inflation process works.

The original CPI inflation structure in FPS (described in Black et al, 1997) was fundamentally based on a Phillips curve

with a series of leads and lags of inflation and a measure of the output gap, much as in the new structure. However, the old system was not able to be compared to the data in as much detail as it can be after the recalibration.<sup>17</sup> By including tradable and non-tradable inflation and inflation expectations as observed data, we are able to evaluate quarterly outturns for those variables and decide how to treat any surprises.

A diagrammatic description of the new model is shown in figure 6. Note that dotted lines denote relationships that are very gradual and/or forward-looking, while solid lines represent relatively direct and immediate influences.<sup>18</sup>

The tradables and non-tradables inflation equations (see Appendix 1) are based on the estimated equations reported in the previous section. The dynamic parameters used in the tradable and non-tradable system are not exactly identical

<sup>17</sup> There was a FPS variable measuring domestic inflation (PDOT), but over history this was effectively obtained by treating a Phillips curve as an identity, and there was no directly observable counterpart to PDOT. The ultimate empirical test of the old inflation system was in the way the model tracked the behaviour of CPI inflation.

<sup>18</sup> The old inflation system also included a number of other influences on inflation such as tax rates and labour costs. However, these were calibrated to have a relatively minor impact. While these could certainly be significant in inflation determination in the future, we have eliminated those terms from the current version of the model pending deeper analysis of how these issues should be handled in the new system.

to the regression results, because they have been calibrated with the overall properties of FPS in mind, but they are fairly close.

To close the model, we needed to decide how to design a model counterpart for the two year ahead inflation expectations survey. Inflation expectations are often modelled as a function of leads and lags of actual inflation. The “leads” of inflation can be thought of as rational forecasts in the sense discussed in section 2. So using a mixture of leads and lags to represent inflation expectations effectively implies that some people are forming expectations with a well-informed view of the future, while others are using rules of thumb based on recent inflation history. A smooth series of lags and leads was found to be an effective proxy for the two year ahead survey, but the data was not very informative as to the extent to which expectations should be forward-looking relative to backward-looking, and this is crucial for the overall properties of the model. The parameterisation we adopted is shown in the Appendix. Essentially, it says that inflation expectations are determined by current inflation and inflation over the last 5 quarters (with a weight of around 70 per cent), and also determined by the medium term future inflation outlook (with a weight of around 30 per cent). This gave model properties that were not too different to the old inflation system.

In figure 7, we compare this model assumption to the behaviour of the survey over history. The chart suggests that the moving average of actual and future inflation does explain movements in expectations. When the blue line (the

moving average of inflation) is above the red line (surveyed expectations), the red line tends to be rising, as our model predicts.<sup>19</sup>

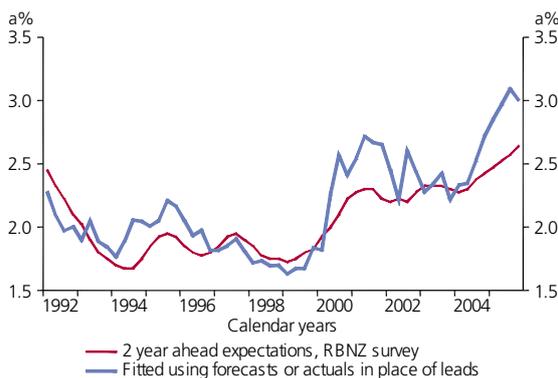
While the direct empirical counterpart to the measure of inflation expectations in the system is a two quarter lag of the two-year RBNZ inflation expectation series, we do not plan to treat the quarterly movements in this series as our only relevant measure of inflation expectations. If it diverges from a broader view of inflation expectations (incorporating other survey measures, wage settlements and the like) we will probably put related judgement into the model forecasts.

### Assessing the new model

We have analysed the response of the model to a range of shocks, comparing the old inflation structure to the new system. In general, the key business cycle dynamics of the model were not greatly changed by the redesigned system. The most interesting change is the fact that the model now makes specific predictions for the evolution of tradable inflation, non-tradable inflation and two-year ahead inflation expectations.

As an example, figure 8 shows the consequences of a temporary 3 per cent fall in the New Zealand dollar caused by a reduction in the willingness of foreign investors to invest here. The depreciation causes a rapid increase in tradables inflation. However, this increase is temporary, as tradables inflation quickly falls below its average level as a result of the currency appreciating back towards equilibrium. At the same time, the lower than normal currency stimulates net exports, which creates a positive output gap and a small but sustained increase in non-tradables inflation. Inflation expectations also rise gradually, as a result both of a higher non-tradables inflation outlook and a lagged consequence of the immediate rise in the CPI. While these channels were implicit in the old FPS framework, the new framework allows much more effective assessment against incoming data.

**Figure 7**  
Inflation expectations compared to the model proxy



<sup>19</sup> A difficulty with historical testing (and estimation) of expectations behaviour is the treatment of lead variables. Here we are using actual data (if available) and Reserve Bank June 2006 forecasts (where the data is not available) as the “rational forecasts”. This makes fitted expectations look high at the end of the sample, because the fitted values assume that the rise in petrol prices over late 2005 and early 2006 was wholly predictable.

Figure 8

A 3% exchange rate depreciation

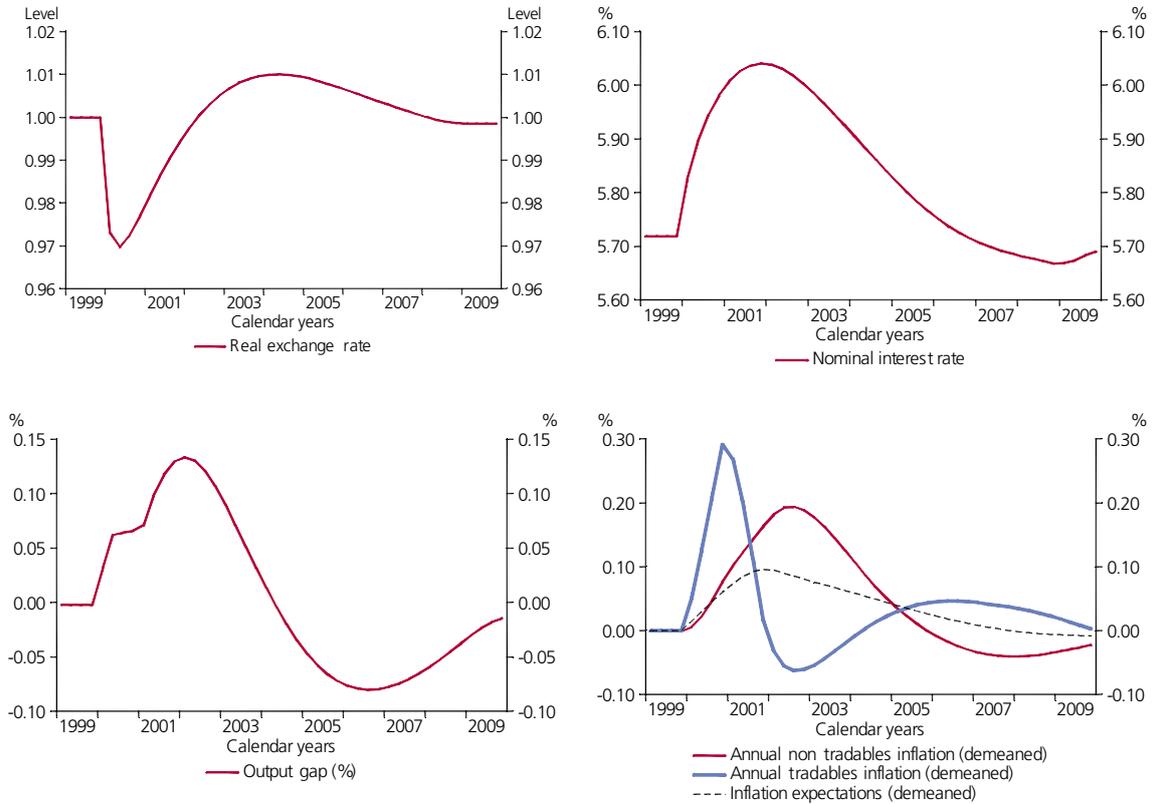
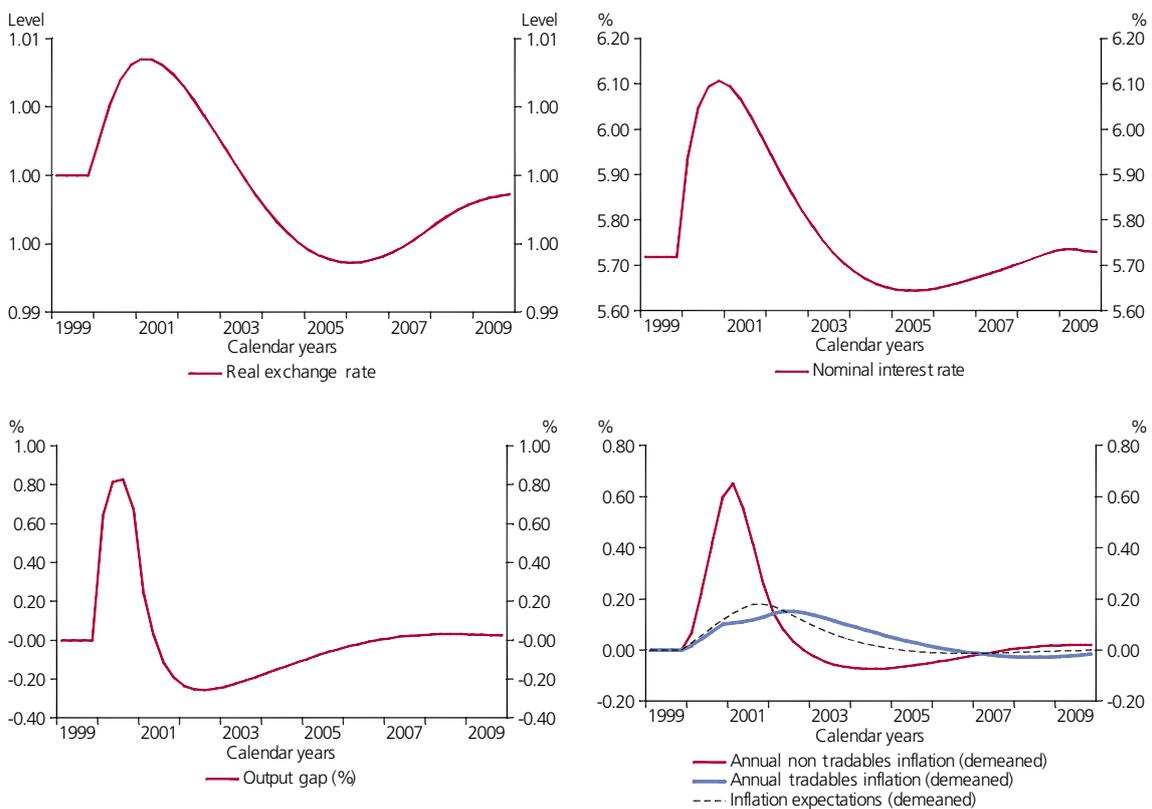


Figure 9

The impact of a temporary shock to aggregate demand



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Figure 9 shows a New Zealand demand shock (for example an increase in the demand for housing), which causes a rise in the output gap and an increase in non-tradables inflation. There is a resulting tightening in monetary policy and a mild appreciation of the exchange rate. Tradables inflation is much more contained in this shock, reflecting the rising currency and the ability to largely meet any rising demand for tradable goods through imports.

In Figures 8 and 9, we have removed the average values from the non-tradables and tradables inflation series and inflation expectations to make them easier to compare. But in the model there is assumed to be a systematic difference between the mean values of tradeables and non-tradeables, with non-tradeables inflation expected to average 0.8 per cent per annum faster than CPI inflation, and tradables inflation about 1.0 per cent lower than CPI inflation. This is consistent with the average difference over recent history. The tendency for non-tradeables prices to rise faster than tradables prices is sometimes described by economists as the Balassa-Samuelson effect.

## 5 Conclusions

This article has shown that a Phillips curve has fit New Zealand data for non-tradeables inflation reasonably well since the disinflation period: non-tradeables inflation has been fairly well correlated with measures of the output gap. We have drawn links between this empirical Phillips curve and a redesigned inflation system in FPS. This system disaggregates the CPI into tradables and non-tradeables inflation, and a survey measure of inflation expectations. The new system makes increased use of actual data, and so is much easier to validate, and more useful in analysing the latest information on inflation and inflation expectations.

A distinction is sometimes drawn between purely statistical models of inflation and “structural” models which take economic theory very seriously. We increasingly interpret FPS as a semi-structural model which incorporates significant economic dynamics that we believe to be relevant and important, but hard to incorporate in fully structural models. Examples of the semi-structural nature of the FPS inflation process include the use of a filtered measure of potential

output and a smoothly evolving (non-rational) measure of inflation expectations. In our quarterly forecasting process, we supplement FPS with inflation forecasts from fully statistical models like those described in Matheson (2005). In the future we hope to make use of more fully structural stories of inflation determination, based on DSGE models, as well.

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## Appendix

### Actual model equations

#### Non-tradables inflation (ntdot)

$$ntdot_t = cpidote_t + ntdot\_cc + (.05 * gap_t) + (.1 * gap_{t-1}) + (.05 * \max(gap_t, 0))$$

Where:

Cpidote denotes inflation expectations.

Ntdot\_cc is a calibration constant that ensures non-tradables inflation averages higher than tradables (the weighted average of ntdot\_cc and tdot\_cc is zero).

Gap is the output gap. The third gap term is an asymmetry term that makes disinflation slightly harder than 're-inflation'.

#### Tradables inflation (tdot)

$$tdot = cpidote + tdot\_cc + .18 * \frac{\sum_{j=-3}^1 pcmch(+j)}{4} + 0.03 * gap$$

Pcmch is the quarterly growth in import prices.<sup>20</sup> A passthrough of .18 into tdot represents passthrough of about .09 (or 9%) into the overall CPI - that is, a 10 per cent change in import prices would raise the tradables CPI by about 1.8% per cent and the overall CPI by about 0.9 per cent.

#### CPI Inflation (CPIDOT)

$cpidot = .556ntdot + .444tdot$  - a simple weighted average identity.

#### Inflation expectations (cpidote)

$$cpidote = .75(cpidote(-1)) + .175 \frac{\sum_{j=-5}^1 cpidot(+j)}{6} + .075 \frac{\sum_{j=2}^{12} cpidot(+j)}{11} + \epsilon_t$$

The driving force in our expectations specification is a fairly long series of leads and lags of inflation.

<sup>20</sup> Technically, within FPS it is actually the first difference of detrended PCM (the relative price of consumption imports). PCM is a model variable built from trade data – it has very similar properties to the Overseas Trade Index Import price series.

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# An assessment of recent Reserve Bank forecasts

Jane Turner

The Reserve Bank's ability to produce good quality forecasts is critical for it to operate monetary policy in a forward-looking environment. As part of the Bank's regular review of its own forecasting performance, we compare the Reserve Bank's forecasts of key variables from the past three years against a benchmark of forecasts prepared by other forecasters. The results from this review suggest that the Bank's forecast performance over recent years has been at least comparable to the average of other forecasters. In the case of CPI inflation and 90-day interest rates, the Bank's forecasts performed slightly better than the average of other forecasters.

## 1 Introduction

It is widely recognised that it takes a considerable time for interest rate changes to have their full impact on inflation. Monetary policy operates in a forward-looking environment in which the Reserve Bank's ability to operate effective monetary policy depends on its ability to produce good quality forecasts.

Inevitably, forecasts of economic activity and inflation will be subject to error. Forecasting is inexact and subject to a range of uncertainties. Most obviously, forecast errors can result from shocks not foreseen when the forecasts were made. By way of illustration, international oil prices have risen some 170 per cent since 2001, and 30 per cent since the start of 2006.<sup>1</sup> Higher oil prices have flowed through into domestic petrol prices and lifted headline inflation rates. Few, if any, forecasters predicted the extent of this oil price 'shock' and the consequent sharp rise in inflation over the past year. Forecast errors can also result from poor judgement, overly simplistic modelling techniques or poor quality data. If these occurrences result in systematic forecast errors, they can have serious policy implications.

The Bank regularly reviews its forecasting performance. These reviews provide the Bank with a better understanding of its forecasts' strengths and weaknesses, and as a result, the bounds of uncertainty that surround future forecasts and policy decisions. The last comprehensive review was conducted by McCaw and Ranchhod (2002). In that study, the authors examined the Bank's forecast performance

between 1997 and 2002 with comparisons to individual forecasters. Their results showed the Bank had tended to underestimate CPI inflation over this period, while its GDP forecasts had been unbiased. The Bank's overall forecasting performance was found to be similar to most other forecasters.

This article provides an update on the Bank's forecast performance, covering the 2003–2005 period. Section 2 provides an overview of the recent economic cycle, highlighting the key drivers of economic activity and inflation. Section 3 details the methodology used to analyse forecasting performance, while results are discussed in section 4. Section 5 concludes.

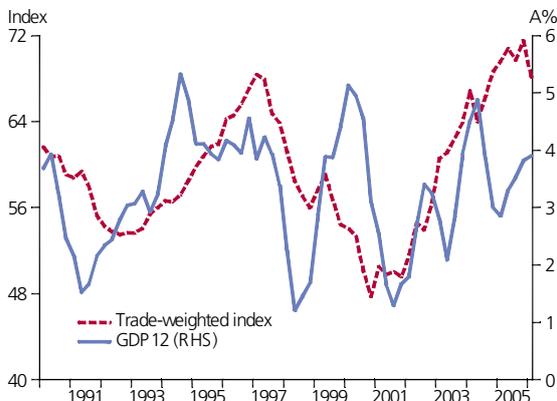
## 2 The recent economic cycle

The current growth cycle, which commenced in late 1998, has been New Zealand's strongest expansion in 30 years. The key drivers of this expansion were initially focussed in the tradables sector, with exporters benefiting from very favourable export conditions created by a low exchange rate, rising commodity prices in world markets and a strong recovery in world economic growth. Strong export receipts soon spilled over into domestic demand in the form of rising household consumption and business investment. But by 2003 this strong performance was generally expected to begin waning as the exchange rate had begun to rise and trading partner growth had weakened amidst increased uncertainty in global conditions.

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<sup>1</sup> Annual average price of the Dubai crude oil price from 2001 through to July 2006.

**Figure 1**  
**TWI exchange rate and trading partner growth (GDP-12)**



Source: RBNZ, Consensus Economics Inc.

**Figure 2**  
**New Zealand dollar commodity prices**

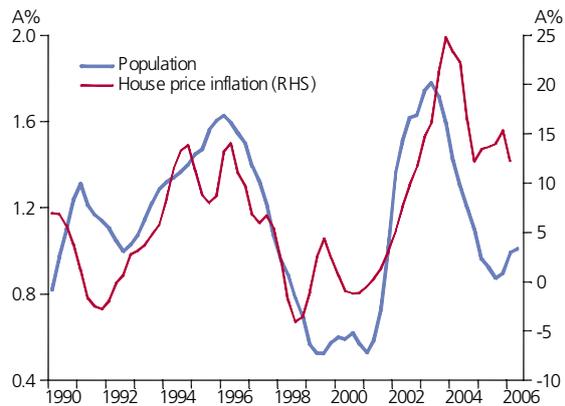


Source: ANZ National Bank Group Ltd.

However, domestic economic momentum was maintained, underpinned by strong population growth, strong construction activity and significant increases in household wealth, mainly in the form of rising house prices. Further, consumption growth was supported by strong growth in employment and labour incomes combined with lower prices for imported goods (due to a higher exchange rate and lower cost goods from developing economies such as China).

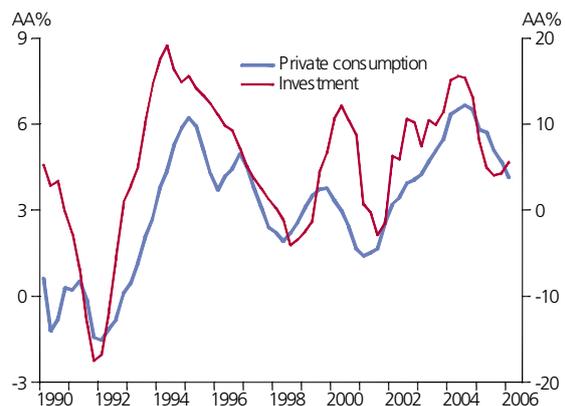
Strong domestic growth, particularly in the construction sector, saw New Zealand quickly absorb spare productive capacity and domestically sourced inflation pressures began to emerge. Initially, headline CPI inflation remained in check as strong non-tradables inflation was offset by falling

**Figure 3**  
**Population growth and house price inflation**



Source: Statistics New Zealand, Quotable Value Ltd.

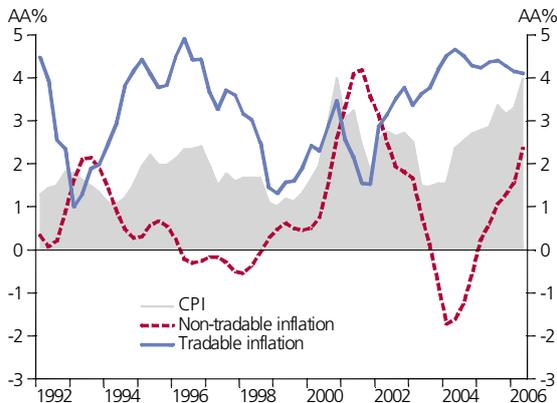
**Figure 4**  
**Consumption and investment growth**



Source: Statistics New Zealand.

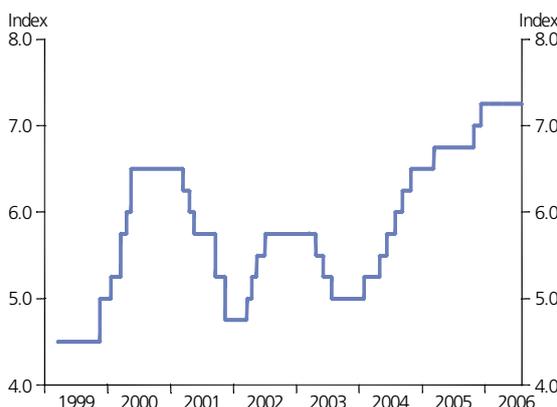
tradables inflation (due to an appreciating exchange rate and falling world prices). However, during 2004 the effects of an appreciating exchange rate began to wane and annual tradables inflation turned positive. Non-tradables inflation remained persistently high, reflecting the prolonged strength in domestic demand. As a result, annual CPI inflation increased from a low of 1.5 per cent at the start of 2004 to 3.2 per cent by the end of 2005. The Bank had gradually tightened monetary policy over this period in response to the strong domestic inflation pressures. The Official Cash Rate was raised from 5 per cent at the start of 2004 to 7.25 per cent by the end of 2005. The extent of the policy tightening cycle was greater than expected by the Bank, its observers and financial markets.

**Figure 5**  
CPI, non-tradables and tradables inflation



Source: Statistics New Zealand

**Figure 6**  
Official Cash Rate



Source: Reserve Bank of New Zealand.

### 3 Methodology

Against this background, how did the Reserve Bank's forecasting performance during this period compare with that of other forecasters? In order to answer that question, it is necessary to establish a framework for assessing the Bank's forecasts.

The standard statistical measures used to evaluate forecast accuracy are the mean forecast error (MFE) and the root mean squared forecast error (RMSE).<sup>2</sup> The MFE statistic captures the degree of bias in forecasts – ie, whether there is

any over- or under-predicting over time.<sup>3</sup> The RMSE provides a measure of forecast accuracy by measuring how far away forecasts were from actual out-turns.<sup>4</sup>

However, as these measures are dependent on the unit of measure, a benchmark is necessary in order for these measures to be meaningfully interpreted. Researchers typically assess forecast performance against that of a 'random walk'.<sup>5</sup> However, in this review we are more interested in our performance relative to other forecasting agencies. One method is to compare forecasts against different agencies individually. This is a useful approach for understanding the source of different views held by each agency. However, this will reveal little in terms of overall performance, as it is difficult to fairly rank different sets of forecasts which have different strengths and weakness. (For example, one set may make moderate errors for every variable, while another makes large errors for just one variable but is very accurate for the remainder. Deciding which set is better can vary depending on your criteria.)

To avoid this difficulty, we have compared our forecasts against a survey average. It has been found that taking an average of a range of forecasts will tend to outperform most individual forecasts, over time. Hence a forecast evaluation against a forecast average is a fairly tough benchmark. We use the *Consensus* forecasts produced by Consensus Economics Inc, which is a private UK-based institution that produces simple forecast averages from a survey of reputable forecasters for a range of economic and financial variables. For New Zealand, the survey covers 16 forecasters

<sup>2</sup> Mean forecast error (MFE) = mean (errors),  
Root mean forecast error (RMSE) =  
 $\sqrt{\text{Variance}(\text{errors}) + \text{MFE}^2}$ .

<sup>3</sup> It is widely known that forecasters tend to underestimate variables such as economic growth or inflation on upswings and overestimate them on downswings. Accuracy should really be measured over a complete business cycle in order to get a fair estimate of actual bias. However, as we have selected a smaller sample, this measure is better interpreted relative to another forecast – ie, who has under- or overestimated the variable the most during an upswing.

<sup>4</sup> The MFE and RMSE are not invariant to the unit of measurement, therefore caution must be applied to comparing error measures of interest rates and growth rates, for example.

<sup>5</sup> Under the simplest random walk model, the forecast of a variable X will be given by last period's value plus a constant representing the average change between periods. Random walk forecasts have often been shown to provide forecasts as good as, or better than, those produced using more elaborate structural models. They are often used as benchmarks for the evaluation of forecasting performance.

Table 1

GDP growth (annual average growth)

	RMSE		MFE	
	RBNZ	Consensus	RBNZ	Consensus
GDP growth – up to 1 year ahead	0.6	0.6	0.0	-0.1
GDP growth – up to 2 years ahead	0.9	0.9	-0.4	-0.4

within New Zealand and the Asia Pacific Region. *Consensus* provides forecasts for calendar year annual average growth for both GDP and CPI.<sup>6</sup> It is unusual to express CPI inflation as an annual average as forecasts are typically produced for annual CPI inflation (that is inflation from the same quarter in the previous year). We have calculated the implied annual average inflation rate from the Bank’s quarterly inflation forecasts. Interest rate and exchange rates forecasts are presented for 3 months and 12 months ahead.

Given that we are only examining forecast performance over a relatively short sample period (3 years), one cannot place too much emphasis on the quantitative results. However, given the nature of economic activity and inflation pressures over the recent cycle, we can still draw useful qualitative inferences from the results.

4 Results

The Bank’s forecasts for GDP growth performed in line with the *Consensus* average, as seen by equivalent RMSE and MFE metrics. Both the RBNZ and *Consensus* under-predicted growth in 2003 and 2004 as the economy remained stronger for longer. Both then over-predicted growth in 2005 as growth weakened sharply, particularly over the second half of 2005 (see figure 7).

Table 2

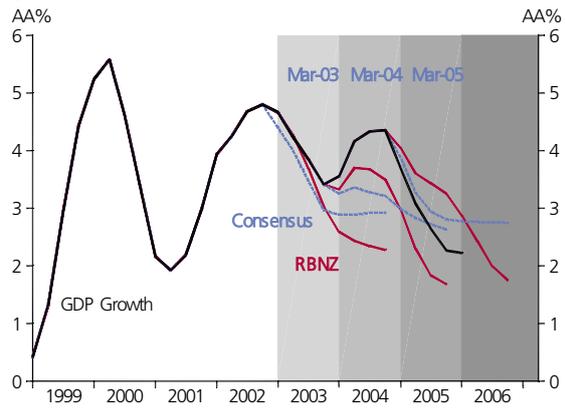
CPI inflation (annual average Inflation)

	RMSE		MFE	
	RBNZ	Consensus	RBNZ	Consensus
CPI inflation – up to 1 year ahead	0.1	0.3	0.0	0.2
CPI inflation – up to 2 years ahead	0.2	0.3	0.0	0.1

<sup>6</sup> The frequencies of the *Consensus* forecasts displayed on the charts are interpolated to quarterly from annual. MFE and RMSE statistics, however, are only calculated from actual *Consensus* values.

Figure 7

Reserve Bank and *Consensus* forecasts for GDP growth



Source: Consensus Economics Inc., Statistics New Zealand, Reserve Bank of New Zealand.

The Bank’s forecasts for annual average CPI inflation outperformed the *Consensus* average over both horizons examined. The MFE reveals that the Bank’s forecasts were unbiased over the sample period. While the *Consensus* forecasts appear biased in the table above, this finding appears to have been significantly influenced by some large forecasts errors over 2003 with the panel over-estimating the strength of inflation through this period. *Consensus* forecasts improved markedly for 2004 and 2005 inflation (see figure 8, overleaf).

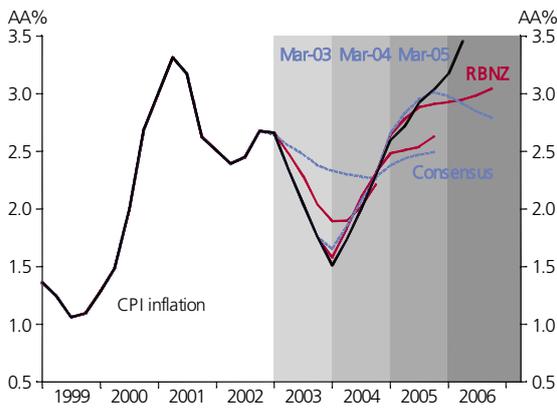
**Table 3**  
90 Day Interest Rates

	RMSE		MFE	
	RBNZ	Consensus	RBNZ	Consensus
90 day - in 3 months time	0.2	0.2	0.0	-0.1
90 day - in 12 months time	0.7	0.9	-0.4	-0.7

**Table 4**  
Exchange Rate Forecasts

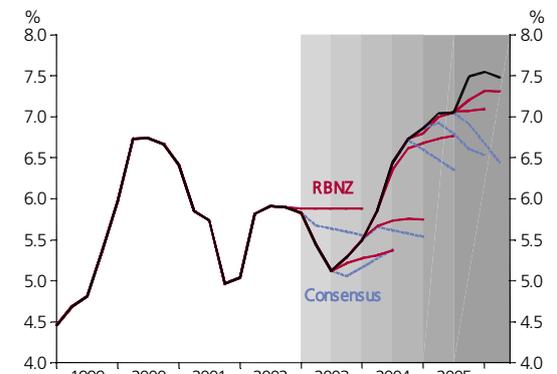
	RMSE		MFE	
	RBNZ	Consensus	RBNZ	Consensus
Exchange rate - in 3 months time	0.0	0.0	0.0	0.0
Exchange rate - in 12 months time	0.1	0.1	-0.1	-0.1

**Figure 8**  
RBNZ and Consensus forecasts for CPI inflation



Source: Consensus Economics Inc., Statistics New Zealand, Reserve Bank of New Zealand.

**Figure 9**  
Reserve Bank of New Zealand and Consensus forecasts for 90-day interest rates



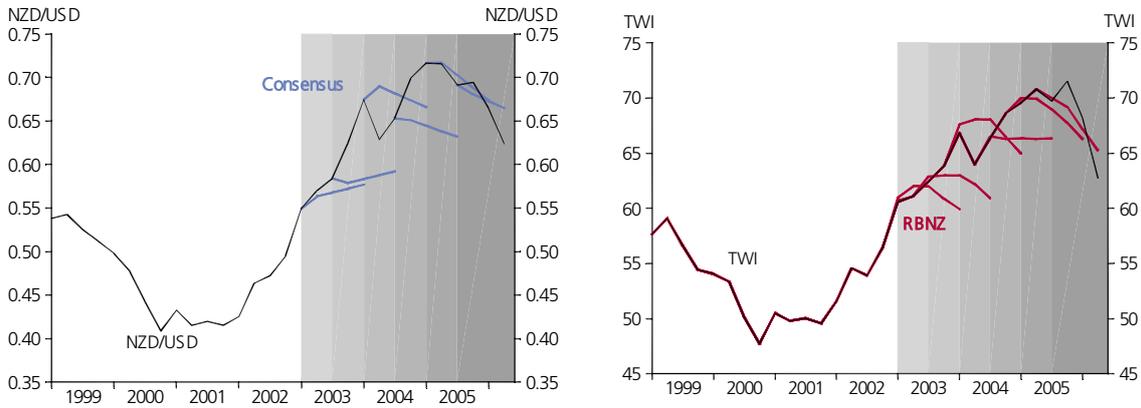
Source: Consensus Economics Inc., Reserve Bank of New Zealand.

The Bank's forecasts for 90-day interest rates perform in line with the *Consensus* average at the 3-month horizon. But at the longer 12-month horizon, the Bank's interest rate forecasts have been slightly better. Both sets of forecasts tended to under-predict the extent to which 90-day interest rates would rise. However, *Consensus* forecasts since late 2004 were consistently predicting rate cuts that did not occur, resulting in a poorer forecast performance than the Bank.

The *Consensus* surveys forecasts of the NZD/USD cross rates while the Bank produces forecasts of the trade weighted index (TWI), so that forecasts cannot be directly compared. However, forecast performance for each respective exchange rate has been comparable. As shown by figure 10 both sets of forecasts tended to underestimate the level of the exchange rate over much of the period.

Figure 10

RBNZ and Consensus forecasts for the exchange rate



Source: Consensus Economics Inc., RBNZ.

## 5. Summary

The results from this study indicate that the Bank's forecast performance over the past three years has been comparable, if not slightly better, than the average of most other forecasters, as reflected in *Consensus* forecasts. Both the Bank and *Consensus* displayed similar forecast accuracy for GDP growth and the exchange rate. Both underestimated the strength of GDP growth over 2003 and 2004 and overestimated the slowdown in growth that occurred during 2005. Likewise, both underestimated the extent of the exchange rate appreciation to a similar degree.

However, the Bank's forecasts for CPI inflation and 90 day interest rates tended to outperform *Consensus* over the 2003-2005 sample period. In particular, *Consensus* forecasts under-predicted the rise in inflation and 90-day rates to a

greater extent than the Bank. In the case of 90-day interest rates, *Consensus* has been consistently expecting rate cuts since late 2004, whereas the Bank had been projecting moderate increases.

It is important to reiterate that the comparisons made in this article relate only to the period. The Bank's performance relative to other forecasters can be expected to change over time as economic conditions vary and as the methods used to make forecasts evolve. The Bank will continue to closely monitor the quality of its forecasts and is committed to making ongoing improvements to its forecasting models and procedures.

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## DISCUSSION PAPERS

DP2006/07

### How costly is exchange rate stabilisation for an inflation targeter? The case of Australia

*Mark Crosby, Tim Kam and Kirdan Lees*

This paper quantifies the costs of mitigating exchange rate volatility within the context of a flexible inflation targeting central bank. Within a standard linear quadratic formulation of inflation targeting, we append a term that penalises deviations in the exchange rate to the central bank's loss function. For a simple forward-looking New Keynesian model, we show that the central bank can reduce volatility in the exchange rate relatively costlessly by aggressively responding to the real exchange rate. However, when we append correlated shocks – to better match summary statistics of the Australian data – we find that the costs associated with reducing exchange rate volatility are larger: output volatility increases substantially. Finally, we apply our method to a variant of a small backward-looking New Keynesian model of the Australian economy. Under this model, large increases in inflation and output volatility accrue if the central bank attempts to mitigate exchange rate volatility.

HSS suggest that the census total for trust dwellings is an undercount. HSS data, together with data on the number of tax returns from private trusts, is used to adjust the 2001 census tenure table. It was found that after adjustment for trust ownership, the home ownership rate still fell between 1991 and 2001. Furthermore, ownership rates fell for all age groups. Some of the difficulties that trusts pose when analysing surveys like the HSS at the unit record level are outlined, as are some suggestions for dealing with these difficulties.

DP2006/06

### Family trusts: ownership, size, and their impact on measures of wealth and home ownership

*Phil Briggs*

The number of family trusts has increased markedly in New Zealand over the last 15 years. This increase has implications for the measurement of household wealth and home ownership, since a significant proportion of dwellings are now held in family trusts. The Household Savings Survey (HSS), which was undertaken by Statistics New Zealand in 2001, collected data on household wealth, including the assets and liabilities of family trusts. HSS data is re-examined, with an emphasis on looking at the types of households that have family trusts, and also at the assets held in these trusts. The 2001 census, which included for the first time a question on whether a dwelling was held in a private trust, is also re-examined. It seems that many census respondents were confused by the census question, and results from the

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## NEWS RELEASES

9 May 2006

### Reserve Bank issues *Financial Stability Report*

The Reserve Bank today released its *Financial Stability Report*, a twice-yearly report that assesses the health of the New Zealand financial system.

Reserve Bank Governor Alan Bollard said in a statement: "New Zealand's financial system is well placed to weather the slowdown in the economy. With few exceptions, financial institutions are well capitalised and profitable. Foreign exchange markets have facilitated an orderly, albeit sharp, depreciation in the New Zealand dollar."

Dr Bollard said the *FSR* highlighted a wide variation in financial exposure among households and financial institutions.

"Household indebtedness has reached a record high, raising households' vulnerability to higher interest rates, unemployment, and a downturn in house prices," he said. "Vulnerabilities may be concentrated in those households that have recently invested in residential rental property."

Dr Bollard said New Zealand's banking sector was profitable, well capitalised, and able to bear increases in impaired assets as economic conditions become more challenging.

"In this environment, credit risk management needs to be monitored closely, especially in light of the implementation of the new Basel II regime for bank capital requirements.

"A combination of rapid growth and comparatively young institutions, which have limited experience in managing a downturn, makes a significant part of the finance company sector particularly vulnerable to a more challenging economic environment. Isolated and individual failures among these institutions are unlikely to threaten overall financial stability, however."

Dr Bollard concluded that some of risks facing the financial system had crystallised since the Bank's last *FSR*.

"Other challenges have increased. Maintaining financial stability will require that risks continue to be adequately identified, priced and allocated to those best able to manage them," he said.

9 May 2006

### New Zealand hosts EMEAP central bank governors

Central bank governors from major countries in the region gathered in New Zealand over the weekend to discuss common issues, Reserve Bank Governor Alan Bollard said today.

The annual Executives' Meeting of East and Asia-Pacific (EMEAP) central banks was held over three days starting 26 May in the South Island, Dr Bollard said. All 11 members of EMEAP – New Zealand, Australia, Japan, China, South Korea, Hong Kong, Singapore, Malaysia, Indonesia, Thailand and the Philippines – attended the meeting.

"We are pleased to have hosted such an influential gathering of regional central bankers," Dr Bollard said. This is the first time the meeting has been held in New Zealand.

The participants had fruitful discussion on topics such as the operation of financial markets in the region and the regulation of banks and financial institutions. The group is working to strengthen regional cooperation in central banking.

The EMEAP regional group has recently coordinated cooperation on the bond market, including measures to make it easier for Asian central banks to buy each others' debt for their reserves.

8 June 2006

### OCR unchanged at 7.25 per cent

The Official Cash Rate (OCR) will remain at 7.25 per cent.

Reserve Bank Governor Alan Bollard said: "Recent economic activity has been weaker than projected in the March *Monetary Policy Statement*. However, the short-term inflation outlook has worsened.

"Growth is expected to remain low through 2006, before recovering in 2007. The much awaited economic rebalancing from domestic spending to exports commenced in late 2005, and is expected to continue over the next two years. Export growth will recover as a result of the lower exchange rate and buoyant demand in world markets. At the same time,

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household spending will be constrained by a continued weakening in the housing market, high petrol prices and a slowdown in employment growth.

“While weaker economic activity will reduce medium-term inflation pressures, the short-term inflation outlook has deteriorated. The sharp decline in the exchange rate over March and April will lead to higher prices on imported goods, although weak domestic demand and foreign exchange hedging by importers may dampen this increase. In addition, oil prices have risen by around 20 per cent since the March *Statement*, leading to higher prices for petrol and other transport items. These two effects together are now expected to keep headline CPI inflation above 3 per cent well into 2007.

“Given the unavoidable nature of these price shocks, it would be inappropriate for monetary policy to try to counteract their short-term inflation effects. However, it is essential that monetary policy hold the line against any second-round effects that could be felt in wages, prices and inflation expectations. A failure to do so would risk inflation becoming entrenched at a higher level, ultimately delaying a return to stronger growth.

“We do not expect to tighten policy in response to the high headline inflation in the short term. But, equally, we cannot afford to ease policy until we have more certainty that future inflation outcomes will be trending down comfortably below 3 per cent. Given this situation, we see no scope for an easing of the OCR this year.”

## 2 June 2006

### Reserve Bank history book released

The Reserve Bank history book *Innovation and Independence: the Reserve Bank of New Zealand 1973-2002*, has been published by Auckland University Press.

The book, covering the recent history of the Reserve Bank, is written by John Singleton, and co-authors Gary Hawke and Arthur Grimes.

The authors note that in several key areas, the Reserve Bank has been at the forefront of thinking in central banking. The Reserve Bank was the first bank in the world to define

its statutory autonomy around a contractual relationship between Governor and Government. It was also the first bank to adopt inflation targeting, an approach to monetary policy since adopted by more than 25 nations worldwide.

The book has been produced in conjunction with the History Group of the Ministry of Culture and Heritage.

The book will be officially launched at a function in Wellington on 13 June 2006.

## 30 June 2006

### Liquidity operations reform

For your information, the Reserve Bank has issued a document which details changes to the Bank's liquidity management regime.

The document confirms the key proposals for a “cashed-up” system; ie, ensuring there is enough cash in the financial system to enable participants to settle their payment obligations. The proposals were released for public comment on 17 March 2006.

The document also provides an implementation timetable and operational guide.

As previously indicated, cashing up the payment system is a technical adjustment and there are no monetary policy implications.

## 3 July 2006

### Reserve Bank releases *Explaining Currency* booklet

The Reserve Bank today released a third edition of its popular *Explaining Currency* booklet.

The booklet walks readers through the history of New Zealand's currency, describes the banknote and coin designs, how banknotes and coins are made, the security features and the life-cycle of a typical bank note. It features the smaller, lighter 10, 20 and 50 cent coins – to be released at the end of this month.

Copies of *Explaining Currency* booklets, which include a poster displaying New Zealand's currency, have been sent to all schools with year 1–8 students. Copies can be

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downloaded from the Reserve Bank's website, [www.rbnz.govt.nz](http://www.rbnz.govt.nz).

Brian Lang, Reserve Bank Currency Manager, says that while we tend to take bank notes and coins for granted, their history and production is fascinating.

"New Zealanders initially relied on a barter system and then on a confusing mix of coins, tokens and notes. New Zealand has had its own national currency only since 1934.

"Today our society relies on money in many forms. We can buy and sell things using coins, bank notes, cheques, credit cards, and by electronic transactions.

"Many of us remember the introduction of decimal currency – the biggest change since the introduction of currency. On 10 July 1967, New Zealand went decimal. This month – on 31 July – we will see another change – the current 50, 20, and 10 cent coins will be replaced with smaller and lighter coins, and the 5 cent coin will begin to be phased out."

#### **4 July 2006**

##### **Delivery of new coins**

I wish to correct a factual error in the *Dominion Post* article, "Furniture vans cart new coins", 4 July 2006. All deliveries of the new 50, 20 and 10 cent coins comply with the security standards of the commercial banks. All vehicles have a certified security guard. The Reserve Bank will not be commenting further on its security arrangements.

#### **5 July 2006**

##### **Reserve Bank issues *Statement of Intent***

The Reserve Bank has released its *Statement of Intent* (SOI) for 2006-2009.

Reserve Bank Governor Alan Bollard said the SOI is the Bank's three-year forward-looking picture of Bank activities: "It highlights the major pieces of work we will be doing this year, as well as all the business as usual."

The SOI recognises increasing demands on the Bank's policy outputs in a changing economic environment. Dr Bollard said it was vital that the Bank's economic toolkit was adequate

to the task of keeping up with the changing nature of our economy.

'In this SOI, we have set strategic priorities for further developing our inflation forecasting capability, including developing new models, and continuing to investigate how we can best maintain price stability while minimising the variability in output, interest rates and the exchange rate.'

'The Bank will be implementing policies on banking regulatory issues, including outsourcing, the Basel II capital adequacy regime for banks, local incorporation, and bank-failure management. We will also be contributing to a review of the supervision of the non-bank financial sector," Dr Bollard said.

A major project will be issuing new-look 'silver' coins from 31 July, with smaller and lighter 10 cent, 20 cent, and 50 cent coins, and the withdrawal of the 5 cent coin. "Logistically, this will be the biggest currency change since decimalisation in 1967 – a change that will deliver considerable savings to the New Zealand taxpayer."

Other priorities include a review of the structure of the Bank's balance sheet to ensure it best meets its statutory requirements; and upgrades to several back-office systems to enhance the Bank's ability to operate in the current demanding environment. There will be further investment to ensure operations can continue in the event of major disasters.

#### **10 July 2006**

##### **Three weeks to smaller lighter coins**

The countdown to smaller, lighter coins has begun.

On 31 July 2006 the current 50, 20, and 10 cent coins will be replaced with smaller and lighter coins, and the 5 cent coin will begin to be phased out. The coins will retain the same "heads" and "tails" designs but the 10 cent coin will be copper-coloured. The \$1 and \$2 coins will not change.

"It's 39 years to the day, on 10 July 1967, that New Zealanders said 'goodbye' to pounds, shillings and pence, and 'hello' to dollars and cents", said Reserve Bank Currency Manager, Brian Lang.

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“In three weeks we will see another change to our coinage, with the introduction of smaller, lighter 10, 20 and 50 cent coins.

“The Bank has worked with a number of interest groups to ensure the changeover to the new coins goes as smoothly as possible. We have had ongoing contact with banks, retailer groups, the vending machine industry, and schools.

“We have also worked closely with the Royal New Zealand Foundation for the Blind and the Association of Blind Citizens New Zealand, to ensure people who are blind or vision-impaired can tell the new, smaller coins apart. The new 20 cent piece has seven grooves around its edge, so is easily distinguishable from the new 10 and 50 cent pieces which have smooth edges.”

Schools around the country have been sent information about the changes. A special website-based educational learning package for Year 1–8 students, featuring the new coins, has also been developed.

Following the introduction of the new coins, on 31 July 2006, there will be a transition period of three months during which existing and new coins can be used. From 1 November 2006 the current 50, 20 and 10 cent coins, and the 5 cent coin will no longer be legal tender, which means retailers do not have to accept them as payment for goods. However the Reserve Bank will always redeem these older coins.

As 31 July draws closer, the Reserve Bank is encouraging people to locate any 5, 10, 20 or 50 cent coins that they may have stored away and either use them or take them to their bank.

For further information, see the Reserve Bank New Coins website – [www.newcoins.govt.nz](http://www.newcoins.govt.nz). The website contains comprehensive information about the coin changes, provides answers to commonly-asked questions, and resources that can be downloaded.

**7 July 2006**

### **OCR unchanged at 7.25 per cent**

The Official Cash Rate (OCR) will remain unchanged at 7.25 per cent.

Reserve Bank Governor Alan Bollard said: “Recent economic developments have been broadly in line with our June *Monetary Policy Statement*. However, economic activity has been a little stronger than expected. Indicators of both consumer demand and business activity have not softened to the degree anticipated. We are also seeing slightly more short-term inflation pressure as a result of the continued upward trend in world oil prices. Headline annual CPI inflation reached 4 per cent in the June quarter and is likely to persist around this level for several quarters to come. We remain wary of the risks to inflation expectations presented by these high headline inflation rates.

“Our medium-term view is for underlying inflation pressures to trend downwards. Economic growth is forecast to remain subdued through 2006 and 2007, and CPI inflation is expected to return within the 1–3 per cent target range by late 2007. The rebalancing of economic activity – away from domestic demand and towards exports and import substitution – is expected to continue and will help to alleviate domestic inflation pressures. The rebalancing will be supported by the weaker New Zealand dollar exchange rate and ongoing upward pressure on effective mortgage rates. Foreign interest rate trends and domestic market expectations are both now working to support our domestic policy stance.

“We maintain our view that the current level of the OCR is consistent with returning inflation to the target range. While second-round wage and price effects remain a risk, we do not expect to have to tighten the OCR further in this cycle. However, a sustained period of adjustment in domestic spending is necessary, and it will be some time before an easing in the OCR can be considered. Certainly we will need to be confident that future inflation is heading back comfortably within the target range.”

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**28 July 2006**

### **Trusts reduce home ownership measures**

A discussion paper released today by the Reserve Bank shows that about one-fifth of household assets are held in trusts, and this has had the effect of lowering census measures of home ownership.

The paper looks at family trusts: who owns them, what they contain, and how trusts affect measurements of wealth, income, and home ownership.

The Household Savings Survey (HSS) was undertaken by Statistics New Zealand in 2001, and collected data on household wealth, including the assets and liabilities of family trusts. The paper re-examines the HSS data, finding that in 2001:

- about 4 per cent of individuals and 12 per cent of couples had trusts;
- total holdings of trusts were \$93 billion – around 19 per cent of all household assets; and
- the average amount held by a trust was \$707,900, compared with an average \$243,600 held by a household.

In the research, HSS data and data on the number of tax returns from private trusts was used to adjust figures on home ownership from the census. The adjusted numbers show that if trust dwellings are viewed as being owned, the home ownership rate in 2001 would have been closer to 70 per cent rather than 68 per cent as shown by the census.

Nevertheless, adjusted ownership rates still decline between 1991 and 2001, although not quite as sharply as the unadjusted rates.

Trust-owning couples with low incomes tended to have high trust holdings. One possible reason for this was that people in this low income group were retired and not earning, but their trusts had accumulated significant assets. Another possibility was that people in this group were those whose incomes are going to the trusts, rather than being received directly.

The paper concludes that trusts substantially affect measures of wealth in surveys such as the HSS. They can also affect

reported income in such surveys, as well as affecting home ownership rates. The paper notes that researchers need to be aware of these effects, and take them into account in their analyses.

**31 July 2006**

### **Introducing .... Smaller, lighter coins**

The time has come for us to lighten up. Smaller, lighter 50, 20, and 10 cent coins were released today, and people can soon expect them in their change.

The new coins retain the same “heads” and “tails” designs but the 10 cent coin is copper-coloured.

The introduction of smaller, lighter coins is one of New Zealand’s biggest currency changes since the introduction of decimal currency on 10 July 1967, said Reserve Bank Currency Manager, Brian Lang.

“The new coins will be convenient for the public and easier for those handling coin in bulk, such as banks and security firms. They are less costly to manufacture, saving the taxpayer approximately \$3 million annually.

“Over the past four weeks 84 million new coins have been delivered to every bank branch in the country.”

The Reserve Bank is encouraging people to locate any old 5, 10, 20 or 50 cent coins that they may have stored away and either use them or take them to their bank.

Since 1967 the Reserve Bank has issued 1,037 million ‘silver’ coins. Based on what happened when the Euro was introduced, the Bank expects a significant amount of the old coins to be returned, Mr Lang said.

Starting today there is three month transition period, when both the old and new coins can be used. From 1 November 2006, the old 50, 20, 10 and 5 cent coins will no longer be legal tender, which means retailers do not have to accept them as payment for goods. However, the Reserve Bank will always redeem these older coins.

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## PUBLICATIONS

*Annual Report*  
*Financial Stability Report*

*Monetary Policy Statement*

*Reserve Bank of New Zealand Statement of Intent, 2004–2007*

*Snakes and Ladders – a guide to risk for savers and investors*

Published in October each year.

Published six-monthly. A statement from the Bank on the stability of the financial system. First copy free.

Published quarterly. A statement from the Bank on the conduct of monetary policy. First copy free, subsequent copies \$12.00.

### Recent Reserve Bank Discussion Papers

2006

DP2006/01	Phillips curve forecasting in a small open economy Troy Matheson
DP2006/02	Forecasting substantial data revisions in the presence of model uncertainty Anthony Garratt, Gary Koop and Shaun P. Vahey
DP2006/03	A small New Keynesian model of the New Zealand economy Philip Liu
DP2006/04	Other stabilisation objectives within an inflation targeting regime: some stochastic simulation experiments James Twaddle, David Hargreaves and Tim Hampton
DP2006/05	Should monetary policy attempt to reduce exchange rate volatility in New Zealand Dominick Stephens
DP2006/06	Family trusts: ownership, size and their impact on measures of wealth and home ownership Phil Briggs
DP2006/07	How costly is exchange rate stabilisation for an inflation targeter? The case of Australia Mark Crosby, Tim Kam and Kirdan Lees

Full lists of Discussion Papers are available from Administration, Economics Department. Lists of the Working Papers and the Research Notes can also be obtained from the Economics Department.

### Pamphlets

*Explaining Currency*

*Central banking in New Zealand*

*This is the Reserve Bank*

*Your Bank's disclosure statement – what's in it for you?*

For further information, go to [www.rbnz.govt.nz](http://www.rbnz.govt.nz), or contact:

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## Articles and speeches in recent issues of the Reserve Bank of New Zealand *Bulletin*

Vol. 68, No. 3, September 2005

### *Articles*

Basel II: a new capital framework  
Recent trends in foreign exchange turnover  
An update on Eurokiwi and Uridashi bonds  
Funding agreements for the Reserve Bank

### *Speech*

New Zealand payment system

Vol. 68, No. 4, December 2005

### *Articles*

Oil prices and the New Zealand economy  
A fresh look at the merits of a currency union  
Monetary policy and economic performance: the experience of New Zealand

### *Speech*

Imbalances in the New Zealand economy

Vol. 69, No. 1, March 2006

### *Articles*

Towards a framework for promoting financial stability in New Zealand  
Changes in the inflation process in New Zealand  
Analysis of revisions to quarterly GDP – a real-time database  
Economic and financial chronology 2005

Vol. 69, No. 2, June 2006

### *Articles*

Confronting divergent interests in cross-country regulatory arrangements  
Modelling for monetary policy: the New Zealand experience  
Major global developments in the new millenium  
Supplementary stabilisation instruments: executive summary

