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Matching workers with jobs: how well is the New Zealand labour market doing?

Rebecca Craigie, David Gillmore, Nicolas Groshenny

Since the trough of the 2008/09 recession, the unemployment rate has remained high. However, some other indicators suggest that there might be less downward pressure on wage and price inflation than the unemployment rate alone implies. We explore this apparent discrepancy by looking at the relationship between vacancies and the number of people unemployed (the Beveridge curve) and by estimating a measure of the effectiveness of the labour market at matching unemployed workers with vacancies. We suggest that both the Canterbury earthquakes and international migration flows may have contributed to an apparent decline in the matching efficiency in the labour market.

1 Introduction

New Zealand’s unemployment rate rose sharply from the beginning of 2008 to mid-2009 and has remained high ever since. A persistently high unemployment rate in isolation suggests substantial slack in the labour market and in the economy as a whole. However, that looks inconsistent with some other labour market indicators. Job advertisements, reported skill shortages, and wage growth suggest that the excess capacity that built up during the recession has dissipated gradually over the subsequent three years. Those indicators suggest less downward pressure on inflation than might be implied by the unemployment rate alone.

How to reconcile the high number of people looking for work with the other labour market indicators is the focus of this article. We use a couple of analytical techniques to try to shed further light on the issue. We look specifically at how the labour market is doing in matching workers with available jobs, and how that may have changed in recent years. Finally, we offer some thoughts on what may have accounted for the apparent change.

2 Looking at the labour market data

We first look briefly at some of these other labour market indicators. For example, the Quarterly Survey of Business Opinion’s (QSBO) measure of how easy it is to find labour has fallen sharply since 2009, and is now around long-run average levels (figure 1).1 This is consistent with feedback received during recent Reserve Bank business visits, suggesting that employers are finding it more difficult to fill vacancies for skilled staff. Figure 1 shows how this QSBO measure has historically been moving closely with our estimate of the unemployment rate gap (the deviation of the unemployment rate from its estimated trend rate). However, since 2010 the fall in the QSBO measure has been inconsistent with the persistently high unemployment rate.

Figure 1
Reported ease in finding skilled labour and the unemployment rate gap (seasonally adjusted)

Additionally, at least on some measures, wage inflation in the private sector appears at odds with a view of considerable excess capacity. After rising to quite high

1 A similar profile can be seen in the measure for unskilled labour.
levels during the expansion of the previous decade, wage inflation fell very sharply during the 2008/09 recession (figure 2). The recovery in LCI wage inflation since then appears consistent with at least some reduction in the degree of excess capacity in the labour market.

We use two methods to infer the evolution of matching efficiency in New Zealand: firstly, the Beveridge curve; and secondly, an estimated measure of matching efficiency based on a standard model of labour market flows.

3 The Beveridge Curve

Looking at the relationship through time between the number of vacant jobs and the number of people unemployed is one way into the issue. Even doing that has its challenges. Job vacancies are generally proxied by the number of jobs advertised. But in New Zealand we do not have a long time series of job advertisements data, and technological change (the rise of internet advertisements) complicates the interpretation of the data we have (see Box 1 for a discussion of some of the data issues).

Figure 3 uses the available data and shows how job advertisements and the unemployment rate have moved over time. Not surprisingly, these two series generally move in opposite directions. When the unemployment rate increases, the number of job advertisements decreases. However, since 2009 the number of job advertisements has recovered somewhat (though as a percentage of the labour force its absolute level is still low) while the unemployment rate has remained high.

So what explains this divergence between the signals from the unemployment rate itself and those from some of the other labour market indicators? One theory that might help explain this divergence is a decline in how well the labour market is doing in matching job seekers with vacant jobs – that is, a decline in matching efficiency.

The possible importance of such a mismatch issue is currently being discussed in several advanced economies, particularly the United States. Several policymakers have related the persistently high rate of unemployment in the United States to an increase in both sectoral mismatch (a shortage of workers in some industries at the same time as unemployment of workers with different skills from other industries) and geographical mismatch (shortages and unemployment across different regions or states). A series of studies suggests that matching efficiency in the United States has declined since the 2008/09 recession. Some studies have estimated that mismatch accounts for 1 to 1.5 percentage points of the increase in the unemployment rate.4

2 e.g. Plosser (2010), and Lack er (2012).
3 e.g. Elsby et al. (2010), Barnichon and Figura (2011).
4 e.g. Daly et al. (2012), Furlanetto and Groshenny (2012), Sahin et al. (2012).

The Beveridge curve is another way of plotting the same information but this approach can shed more direct light on whether there has been a decline in matching efficiency. All else equal, points closer to the origin represent greater matching efficiency: for any number of
advertised vacancies, the unemployment rate is lower – or any particular unemployment rate is maintained with less need to advertise vacancies.

Figure 4
A stylised Beveridge Curve

Figure 4 shows a stylised Beveridge Curve, with the unemployment rate on the horizontal axis and the vacancy rate (the ratio of vacancies to the labour force) on the vertical axis. The relationship is negative, with movements along the curve representing cyclical changes in the aggregate demand for labour. During booms, firms create more new jobs (vacancies increase) and unemployment declines (moving from A to B). In bad times, firms create fewer new jobs (vacancies decrease) and unemployment rises. The convex shape of the curve is consistent with the idea that as the labour market becomes tighter in the expansionary phase of cycles, firms need to advertise more and more vacancies as they compete for a shrinking pool of unemployed workers. Similarly, when the labour market becomes slacker during recessions, firms can reduce their search efforts and yet still fill the remaining vacancies.

A wide variety of factors can cause shifts in the Beveridge Curve. These include changes in matching efficiency, changes in the supply of labour, or changes in labour market regulation. A decline in matching efficiency, all else equal, will result in an outward move in the Beveridge curve. For example, firms are advertising more vacancies (labour demand has increased) and yet the unemployment rate remains high (employers are unable to find suitable workers), for example, a move from A to C in figure 4.

Figure 5 presents the Beveridge Curve for the New Zealand economy from 1994. Unemployment rate data are taken from the quarterly Household Labour Force...
Survey (HLFS). Because of doubts about whether one can simply aggregate newspaper and internet advertisements, we construct the Beveridge Curve using percentage deviations from trend for the vacancies variable, rather than the more usual levels format.

4. A measure of matching efficiency

Taken on its own, the simple New Zealand Beveridge curve shown in the previous section might suggest that there was no sustained departure from previous labour market relationships. In this section we consider a more formal approach to measuring the matching efficiency of the labour market.

We outline how our measure of matching efficiency is estimated in Box 2 overleaf. It starts from the insight that the number of new hires (that is, the matches of job seekers with vacancies) depends on both the number of job seekers and the number of vacancies; but also on how effective the labour market is at matching job seekers with vacancies. For example, an increase in the matching efficiency of the labour market will create more jobs with the same number of job seekers and vacancies. This matching efficiency, which can vary over time, is what we are trying to estimate here.

Matching efficiency is affected by the alignment between vacancies and workers’ characteristics (i.e. the skills required/possessed and geographical location), as well as by how intensely firms and workers are searching (to fill and find jobs respectively). These characteristics are captured implicitly in our measure of matching efficiency.

Figure 6 plots our time-varying estimate of matching efficiency. On this measure, the ease with which job seekers are matched to job vacancies has varied considerably over time. Matching efficiency reached a low in late 2007, at the peak of the long boom, when the unemployment rate was very low and firms with vacant jobs were finding it difficult to find the right people to fill them. It is estimated to have risen through the 2008-2009 recession: vacancies fell, but it became materially easier to fill the vacancies that existed. After reaching a peak around mid-2010, this measure of matching efficiency has been continuously deteriorating and is currently at a new record low. The implication of this measure is that the labour market is doing as bad a job at matching...

Figure 5
A New Zealand Beveridge curve, 1994-2012

Source: ANZ Bank, Statistics New Zealand, RBNZ estimates.

The relationship between the unemployment and vacancy rates is negative, as expected. It appears that the curve had shifted inwards during the recession in 2009 (the last few black dots in figure 5). During that period vacancies fell away faster than would have been expected given the unemployment rate. Over 2010 and early 2011 the previous relationship looks to have re-established itself (the first 6 or 7 red dots in figure 5). This is the same period in which the reported ease in finding labour has decreased (see figure 1).

Previous research has identified “a counterclockwise adjustment pattern” (i.e. an upward movement, before a leftward movement) in Beveridge Curves in the aftermath of severe recessions, as vacancies adjust more rapidly than the unemployment rate as the economy recovers. This lagged response of the unemployment rate to increases in vacancies may have contributed to the apparent inward shift in the New Zealand Beveridge Curve during the recession and the move back outwards from 2010.

5 Daly et al. (2012); Dutu et al. (2009).

The very narrow bands around the matching efficiency estimate between 2000 and 2004 may reflect the introduction of and sharp increase in internet vacancies over this period.
Box 2
A measure of matching efficiency

We apply the methodology proposed by Furlanetto and Groshenny (2012a, 2012b) to estimate variations in matching efficiency in the New Zealand labour market over time. This approach is based on search and matching models of labour market flows developed by Diamond, Mortensen and Pissarides (Pissarides (2000) contains a full presentation of the search and matching model).

In this model, the number of people employed \(N_t\) is represented through time as

\[
N_t = (1 - \delta_t)N_{t-1} + M_t
\]  
(1)

where \(\delta_t\) (delta) denotes the separation rate (the rate at which those who were employed in the previous period become unemployed or exit the labour force) and \(M_t\) is the flow of newly hired workers in period \(t\).

The number of newly-hired workers \(M_t\) is a function of the number of job seekers \(S_t\) and the number of vacancies \(V_t\), which are combined using a “matching function”. Consistent with extensive empirical evidence in the literature, we assume that the matching function is Cobb-Douglas with constant returns to scale:

\[
M_t = \zeta_t S_t^\sigma V_t^{1-\sigma}
\]  
(2)

The pool of job seekers in period \(t\) is given by

\[
S_t = L_t - (1 - \delta_t)N_{t-1}
\]  
(3)

where \(L_t\) denotes the labour force, the sum of the numbers employed \(N_t\) and the numbers of people unemployed \(U_t\),

\[
L_t = N_t + U_t
\]  
(4)

So the number of people seeking jobs in a particular period is the number unemployed in the previous period and those leaving their current jobs in this period.

Putting in estimates for each of these terms \((M_t, S_t, V_t)\) we can then jointly estimate \(\zeta_t\) (zeta) and \(\sigma\) (sigma). Zeta is our measure of matching efficiency (or the effectiveness of the labour market at matching job seekers with vacancies), and can vary over time. Sigma is the elasticity of new jobs with respect to the number of job seekers for any given degree of matching efficiency, and is a constant in our model.

For the empirical estimation we use quarterly data (not detrended) from 1995:Q1 to 2012:Q2 on the labour force, vacancies, unemployment, separations and new hires to jointly estimate \(\sigma\) and matching efficiency \(\zeta_t\). (Data on separations and new hires used here are not published, but were supplied by Statistics New Zealand from their HLFS survey by special request. Statistics New Zealand’s Linked Employer-Employee Data (LEED) is qualitatively similar, but less up to date.)

Our estimate of \(\sigma\) lies around 0.6, which implies (because it is greater than 0.5) that changes in the number of job seekers has a greater impact on the number of new hires than a similar percentage change in the number of vacancies. This value is in line with a broad empirical literature on the matching function. (See Petrongolo and Pissarides (2001) for a survey of the empirical literature on the matching function).
workers to vacancies as at any time over the past 15 years – even worse than at the peak of the cycle when the unemployment rate was only 3.5 percent. Over the period 2006-2012 our estimates of matching efficiency are not inconsistent with developments in the QSBO “ease of finding skilled workers” measure when compared with the unemployment rate itself (figure 1).

**Figure 6**
New Zealand labour market matching efficiency
*(deviation from mean)*

Quite how we should interpret these changes in the matching efficiency parameter is not clear. On the one hand, the model is estimated over a relatively short period of data (constrained by the absence of earlier vacancies data), amounting to less than two full cycles in economic activity and employment. But on the other hand, the gap between what the unemployment rate taken in isolation might suggest, and what some of the other labour market indicators suggest, implies that the recent deterioration in the matching efficiency parameter is probably capturing something real. If so, what might be explaining the apparent deterioration?

5 Why might matching efficiency have worsened?
In this section we consider two possible factors which may have influenced matching efficiency in New Zealand over the past few years.

**The Canterbury earthquakes**
The Canterbury earthquakes of 2010 and 2011 severely disrupted the local labour market. Many thousands of people left Christchurch for other parts of the country or overseas. The earthquakes caused a major change in the pattern of demand.7 Most notably, the tourist and accommodation sectors were hit hard as many of the city’s hotels were destroyed or made inaccessible. The number of international tourist arrivals dropped, and the number of foreign students studying in Christchurch also fell sharply. On the other hand, demand for demolition, repairs and construction skills, and associated professional services, has risen considerably.

As a result, there has been a change in the pattern of employment – for example, a marked decline in retail and hospitality employment while demand for construction workers and, for example, geotechnical engineers has increased. Many of the displaced workers will have had quite different characteristics than the requirements of the newly available jobs. Despite a fall in aggregate employment, there have been signs of difficulties in recruiting workers with desired skills. Online advertisements for skilled workers in Canterbury have doubled since early 2011, and there appears to have been growing difficulty in matching workers with vacancies.

Regional vacancy data are only available since 2007, but they allow us to construct regional Beveridge Curves for the last five years, encompassing the impact of the earthquakes.

The regional Beveridge Curves (figure 7) help illustrate that the size of a labour market influences the degree of matching efficiency. In large labour markets there is a higher probability that employers will find an exact match for the skills and experience they are looking for to fill each job opening (even when the large and small markets have the same vacancy to unemployment ratios).8 Similarly, in larger labour markets displaced workers will typically find it easier to find a new job closely matching their skills and aspirations. So we would expect matching efficiency to be higher and more resilient to exogenous influences in larger labour markets.

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7 Parker & Steenkamp (2012).
Regions dominated by major cities, with their larger and more concentrated labour markets, should have relatively higher matching efficiency and more compact Beveridge Curves. This is what we see for Auckland (figures 7a and 7b). By contrast, we would also expect that regions such as North Island Other and South Island Other, which are aggregates of many smaller labour markets, to have lower matching efficiency and therefore more dispersed Beveridge Curves. This may partly explain the dispersion we observe in figures 7c and 7e.

7c: North Island Other

7d: Canterbury

7e: South Island Other

As the regional Jobs Online data are available only in indexed form, vacancy rates have been calculated by indexing the labour force for each region to the same quarter as the vacancy data (June 2007) and using these indices as denominators. Unemployment rates for the various regions have been calculated using unemployment and labour force data from the Household Labour Force Survey.

Source: Ministry of Business Innovation and Employment, Statistics New Zealand, RBNZ estimates.

Note: The region North Island Other is the North Island excluding Auckland and Wellington regions, while South Island Other is the South Island excluding Canterbury.
like the curves of Auckland and Wellington, given that Canterbury’s labour market is dominated by the larger Christchurch labour market.

The rise in job advertisements in Canterbury has far outpaced that of other regions of the country over the past two years, but the unemployment rate has remained high. This dramatic rise in vacancies appears to reflect both the increased intensity of search that firms have had to undertake to attract the specific sorts of workers they need, and on the other hand the high unemployment rate probably reflects the displacement of workers from the industries that shrank – many of whom cannot readily transfer into other sorts of jobs. Such a sizable disruption of the region’s economy (which represents 14 percent of the country’s labour market) may also have been large enough to materially influence aggregate matching efficiency.

International migration

In New Zealand, more than in most advanced economies, international migration flows are large compared to the size of the labour market. Migration flows influence the quality, variety and quantity of workers’ skills available on the local labour market. As such, these flows may be an important determinant of matching efficiency. The nature and direction of that influence is not clear a priori.

Much of the movement in net migration reflects, and is reflected in, cyclical factors that do not affect matching efficiency (i.e. they are associated with movements along the Beveridge Curve, rather than shift of the curve). In the short-run, the demand effects of increased net immigration outweigh the supply effects, so that increased migration increases economic activity and reduces unemployment. For example, during a boom in the domestic economy fewer workers are tempted to depart and others living overseas may return.

However, net migration flows can also change the mix of skills in the economy, which can have structural implications for the economy. A net population outflow may reduce the pool of skilled labour, and if the demand for skilled labour has not also fallen, there will be fewer suitable people available to fill any vacancies, implying a decline in matching efficiency. On the other hand, if net outward migration of skilled labour increases in response to an autonomous decline in demand for skilled labour, then the outflow would tend to improve matching efficiency – the unemployment rate for those skills would not rise as far as the decline in vacancies might suggest. Ultimately the contribution of migration to the evolution of New Zealand’s labour market matching efficiency is an empirical question. Here, we can only offer some initial suggestions.

Dutu et al. (2009) find that increases in net migration are associated with deterioration in their measure of matching efficiency for the New Zealand labour market. They rationalise their result by suggesting that, within the observed net inflow of migrants, there must have been a net outflow of qualified workers – thus driving down matching efficiency. However, we show some data which might appear to suggest the opposite conclusion about the role that migration flows have played in New Zealand, especially in the past couple of years.

Figure 8 plots our estimate of matching efficiency against net migration (permanent and long-term migration flows of working age). These two series move together to some extent, although the relationship is not tight, suggesting that migration is only one of many influences. The matching efficiency troughs in 1999 and 2007 coincide with periods of weak net immigration. Similarly, the decline in matching efficiency during 2010 and 2011 is associated with a decline in net migration.

Figure 8

Matching efficiency and net permanent long-term migration

(quarterly, seasonally adjusted)

Source: Statistics New Zealand, RBNZ estimates.
New Zealand’s migration data do not give us information about the skills of migrants arriving in or leaving the country. But one possible way to proxy skill flows is to look at the age composition of net migration. If prime age workers are more skilled and experienced than their younger cohorts, a net loss in prime age workers (relative to the net flow of younger workers) would imply that the skill content of the labour force has decreased (all else equal). If the demand for skilled workers had not fallen to the same extent, this would lead to a deterioration in matching efficiency. Of course, it is also possible to see shifts in the demands for different types of skills: in some cases, skills possessed more often by younger workers might be those most heavily in demand, in which case relatively larger net outflows of younger workers could also worsen matching efficiency.

Figure 9
Net permanent migration (arrivals less departures), by age
Quarterly, seasonally adjusted

![Figure 9](image_url)

Source: Statistics New Zealand, RBNZ estimates.

Figure 9 shows the age composition of New Zealand’s net permanent and long term migration (arrivals less departures) over time. Even though net migration has been fairly flat over the past couple of years, what is striking is the shift since 2010 towards a substantial net outflow of those aged between 35 and 54 (the group with the highest labour force participation rate and the lowest unemployment rate). By contrast, there has still been a net inflow of those aged between 15 and 34 – a different situation than over the 1998 to 2000 period when there were net outflows of both the more experienced and less experienced cohorts. To the extent that demand for skilled workers remains strong, as the QSBO would suggest, this net outflow of prime age workers would be consistent with the estimated decline in matching efficiency.

6 Conclusion

In this paper, we use some analytical techniques to try to shed some light on what has been going on in the New Zealand labour market over the past few years. The unemployment rate suggests a lot of excess capacity in the labour market (and there are certainly a lot of people unemployed, looking for work), but some other indicators suggest that the labour market is tighter, and less disinflationary than the unemployment rate alone might suggest. We report estimates of a modelling exercise suggesting that the labour market has become less efficient in matching the skills required by employers and those of job seekers. The Canterbury earthquakes, and the big structural changes in the patterns of economic activity in Christchurch, appear to have caused a significant regional decline in matching efficiency. The net outflow from New Zealand of prime age workers over the past couple of years, even as demand for skilled labour has been increasing, may also have contributed to the apparent decline in matching efficiency across the entire country.

References


efficiency and business cycles fluctuations,” Reserve Bank of New Zealand Discussion Papers, 2012/06.


ARTICLES
What is the repo market? Why does it matter?
Bevan Cook

The repurchase (‘repo’) market was a key channel through which the Global Financial Crisis was transmitted. With activity in these markets now recovering, pressure is mounting for regulators elsewhere to increase the resilience of repo markets so that they become a more stable source of funding during periods of market stress.

New Zealand’s repo market has not suffered from the same kind of issues, primarily because financial institutions here do not use repos to gain leverage. Furthermore, the small size of the New Zealand repo market and the dominance of low-risk collateral have meant that it is less likely to transmit shocks to other markets. Nevertheless, the Reserve Bank continues to monitor local repo market developments carefully.

This article outlines the functioning of repo markets, as well as recent developments both offshore and in New Zealand, and touches lastly on the outlook for these markets.

1 Introduction

Repurchase agreements, or ‘repos’, are a form of secured borrowing and lending. In the New Zealand context, repos are predominantly used by banks for managing short-term fluctuations in their cash holdings, rather than for general balance sheet funding. However, in many offshore markets, there are entities that use repo markets to fund leveraged position-taking in securities. Some major securities firms, such as Lehman Brothers and Bear Stearns, funded a substantial portion of their balance sheets in this way.

The repo market was a key channel through which the Global Financial Crisis (GFC) was transmitted.1 As asset prices declined during the crisis, repo lenders increased the amount of collateral required for a given level of cash lending. This meant that investors holding leveraged portfolios of securities were not able to undertake the same level of secured borrowing via repo markets as they had previously. The ensuing funding shortfall forced investors to lower their leverage by selling assets, which contributed to even lower asset valuations that fed back into further asset sales, creating a ‘vicious cycle’. Stresses also appeared in repo markets backed by government securities, as exceptional demand for these safe-haven assets led to shortages.

Overseas regulators have since been seeking to increase the resilience of repo markets so that they become a more stable source of funding during periods of market stress.2 In this way, regulators hope to avoid a repeat of the events that exacerbated the crisis. More recently, the focus on repo markets has intensified, given signs of revival in some markets, which had been in steady decline since the crisis.

Activity in New Zealand’s repo market has also recovered, with turnover in repos that use government securities as collateral hitting record highs in late 2011. However, New Zealand’s repo market is different from those offshore because domestic banks, which are the main market participants, do not typically rely on repos for funding. The resulting low level of leverage limits the sensitivity of the market to swings in risk appetite. Furthermore, the small size of our repo market and the dominance of low-risk collateral means that it is much less likely to transmit shocks to other markets. As a result, we do not believe that the New Zealand repo market poses a systemic risk to the wider financial system. However, we will continue to monitor developments in this market.

2 Repurchase agreements

A repurchase agreement is a contract in which a seller of securities agrees to buy them back at a later date at a predetermined price (see figure 1, overleaf). A reverse repurchase agreement, or ‘reverse repo’, is a contract in which a buyer of securities agrees to sell them back at a later date at a predetermined price. The two agreements


are the opposite sides of the same transaction. The buyer of the securities is the lender, while the seller of the securities is the borrower, using the securities as collateral for a loan at a fixed rate of interest.

Figure 1
Repurchase agreement structure

A key distinction between repo lending and a collateralised loan is that legal ownership of the security is transferred, providing the repo lender with stronger control over the collateral, as well as quick access to collateral if the counterparty defaults. Other key features of repo agreements include:

• At the termination date, when the borrower repays the lender, the repurchase price for the collateral will include an interest payment, sometimes called the repo rate. A repo that uses a mixture of non-specific government securities as collateral is known as a general collateral (GC) repo, and the repo rate in this case is known as the GC rate. The relative safety of government securities allows the GC rate to be lower than other repo rates.

• The lender is only exposed to changes in the value of collateral if the borrower defaults, because the forward contract sets the price in advance at which the lender resells the collateral. To limit this exposure, the amount of cash borrowed is typically less than the current market value of the collateral. The difference, which is known as a ‘haircut’, protects the lender against changes in market value of the collateral.

• Collateral substitution occurs when the borrower in a GC repo needs to reclaim a specific government bond that it has provided as collateral. The borrower is able to replace the bond with another of equivalent value and quality (for a fee) in order to keep the repo agreement intact.

• If the market value of the collateral changes by a pre-determined amount, either party to the transaction can make a ‘margin call’. This means that additional collateral is added, or existing collateral is released, to realign its total market value with the amount of the loan (plus any required haircut).

3 Participants in repo markets

Participants in the repo market include entities that wish to manage short-term fluctuations in their cash holdings on a secured basis. Idle cash is invested via reverse repos, while cash shortages are financed via repos. These transactions are typically short-term in nature, reflecting the needs of such participants.

Security holding institutions, such as fund managers, sometimes use their securities to take advantage of favourable repo rates. In the case where the repo rate on a specific security falls substantially, fund managers that own these bonds are able to borrow cash at a cost significantly lower than the prevailing market rates.

Financial institutions that are in the business of taking positions on the direction of interest rates can use repos to build up their inventory of securities through leverage. For example, if the required haircut is 2 percent, a hedge fund with $2 in equity can finance the purchase of $102 worth of government bonds by borrowing $100 in a repo contract and using these same bonds as collateral for the repo. The borrower is thus able to take on a $102 exposure that is backed by $2 in equity – equivalent to a leverage ratio of 51 to 1. A trader who expects interest rates to fall, and thus bond prices to rise, will wish to buy bonds in this way to increase potential profits.

Reverse repos on a specific bond allow traders to take a ‘short’ position in that bond. A trader uses a reverse repo to borrow a bond, which they can then sell outright in the market, to finance the cash leg of the reverse repo. When the repurchase agreement matures, the trader can buy back the bond outright, hopefully at a lower price than they sold it for, and return it to the counterparty from which

they borrowed it. Alternatively, the trader could engage in another reverse repo to stay short the bond.

In some countries, central banks are also active participants in repo markets, using repos and reverse repos for liquidity management. See section 7 for further details on the Reserve Bank’s role in the New Zealand market.

4 International experience with repo markets

The repo market was the fastest growing wholesale funding market in developed economies prior to the GFC. By the end of 2007, the value of repos outstanding in the euro area was surveyed at around €3.2tn, while primary dealers in the US, which account for around 90 percent of US activity, had around US$4.1tn in outstanding repo agreements (see figures 2 and 3). Repo agreements appealed to a broad range of investors because of the protection provided by the legal transfer of collateral to the cash lender.

Figure 2
European Union repo market size

But despite its perceived safety, repo market activity collapsed during the crisis, as the market value of collateral declined and fears over counterparty risks rapidly spread. Problems began because not all repos were conducted using low-risk government securities (see figure 4).

Instead, collateral included assets whose value became increasingly uncertain as the crisis deepened. Lenders protected themselves by raising the size of haircuts on riskier forms of collateral. As a result, leveraged investors that relied on the repo market for funding found that their existing level of equity was no longer sufficient to support their trading portfolios, leading to fire sales and further falls in prices. What followed was a downward spiral of heightened volatility, rising haircuts, forced selling, and lower valuations.

Demand for government securities soared in the ensuing flight to safety. As more and more investors chose to hold on to US government bonds, the supply of collateral for the GC repo market in the US withered and

Figure 3
US repo market size

Figure 4
US tri-party7 repo collateral by type (as at May 2012)

Note: Mortgage-Backed Securities (MBS), Collateralised Mortgage Obligation (CMO)
Source: Federal Reserve Bank of New York

Instead, collateral included assets whose value became increasingly uncertain as the crisis deepened. Lenders protected themselves by raising the size of haircuts on riskier forms of collateral. As a result, leveraged investors that relied on the repo market for funding found that their existing level of equity was no longer sufficient to support their trading portfolios, leading to fire sales and further falls in prices. What followed was a downward spiral of heightened volatility, rising haircuts, forced selling, and lower valuations.

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A substantial portion of repos in the US are “tri-party repos” (around 50% in May 2012), in which a third party acts as an intermediary in the transaction.
activity in this market also contracted. The GC repo rate spiked lower relative to expectations for monetary policy (see figure 5), as cash lenders became willing to accept lower returns on loans backed by safe-haven collateral.

The collapse of the repo market contributed to a liquidity shock that had far-reaching consequences for the global financial system. The impact was transmitted to other markets as an increasing number of institutions, which were dependent on repo funding, were forced to sell assets.10 The deterioration in market conditions that followed was extremely rapid, reflecting the short tenor of repo lending (see figure 7) and the high leverage of some non-bank financial institutions.

5 How does the New Zealand repo market differ from that offshore?

New Zealand’s repo market is less developed than those in most other Western economies. The primary participants are retail banks and the Reserve Bank, both of which use repo for short-term liquidity management. Unlike in some of the more developed offshore markets, there are no financial institutions specialising in using repo markets to take leveraged positions on the underlying securities. Two factors contributing to this absence are the limited pools of domestic savings and the lack of liquid securities markets.

Figure 5
Three-month GC repo – OIS8 spreads

Signs of stress could also be seen in a sharp rise of ‘failed’ transactions (see figure 6), as collateral was not presented to counterparties on time. Fails can increase suddenly when delayed collateral transfers have knock-on effects to other transactions due to the tightly timed nature of repo transactions. Meanwhile, persistent fails are more likely to occur when there is a low (or negative) cost of failing because repo rates are close to (or below) short-term interest rates.9 The negative impact that persistent fails can have on market liquidity and stability prompted the industry body in the US to introduce penalties for late settlement.

Figure 6
Transaction failures in the US

The most notable implication of these factors is that a repo market exists only for government securities in New Zealand. Because this market is mostly used for short-term liquidity management, repos are also predominantly

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8 Overnight Indexed Swap (OIS) rates are benchmark interest rates that provide a useful gauge of monetary policy expectations.


Source: Bloomberg

Source: Federal Reserve Bank of New York
short term, with most having an original maturity of less than 14 days (see figure 8). Participants do not generally require haircuts on their cash lending because the short tenor of these transactions limits the exposure to changes in collateral value. The Reserve Bank is the main exception, requiring haircuts of 2 to 3 percent on its Open Market Operations (see section 7 for further details).

Figure 8
New Zealand repos by maturity

Note: Locally incorporated banks only, 18 month average to Oct 2012
Source: Reserve Bank of New Zealand, NZ Clear

Prudential supervision by the Reserve Bank limits the degree to which retail banks can undertake leveraged position-taking in the repo market. In particular, the Bank’s prudential liquidity policy limits their reliance on short-term wholesale funding.11 This policy additionally strengthens banks against future periods of funding stress by requiring them to hold adequate levels of ‘liquid’ assets, such as government securities, that can be readily sold or repoed regardless of market conditions.

The key point here is that a disruption in the New Zealand repo market is far less likely to spill over into other asset markets. This is because the lack of leveraged position-taking, the dominance of low-risk collateral, and established regulatory oversight of the main market participants should reduce the scope for pro-cyclicality.

6 Developments in New Zealand repo markets

Activity in the New Zealand repo market has recovered over the past few years, with repo turnover hitting new record highs in late 2011 and again in early 2012 (see figure 9). The Government Bond Turnover Survey12 indicates that repo turnover reached $80bn per month during this period, from lows of around $20bn in 2009. Figure 10 also shows that turnover in the market for outright purchases and sales of government bonds has picked up, although to a lesser extent.

Figure 9
Government bond turnover survey

Note: Locally incorporated banks only, 18 month average to Oct 2012
Source: Reserve Bank of New Zealand, NZ Clear

An increase in government securities issuance (see figure 10) was a key driver of the recovery in both repo and outright bond markets. In terms of repo markets, an increase of government securities on issue raises the amount of eligible collateral in circulation, thereby encouraging banks to use those markets. Indeed, as registered banks’ ownership of government securities has increased, repo turnover has picked up (see figure 11, overleaf).

Figure 10
Total government securities on issue

Note: Locally incorporated banks only, 18 month average to Oct 2012
Source: Reserve Bank of New Zealand

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12 The Government Bond Turnover Survey is sourced from NZClear and relies on market participants to accurately enter details of their transactions. The bond turnover statistics were revised by the Bank on 3 September 2012, after an internal audit of the data identified systematic under-reporting of specific trades.
This recovery in the markets follows a period from 2004 to 2008 when there was a decline in net new issuance of government securities, as the government consistently ran budget surpluses. Over this period, liquidity in the repo market dropped and the frequency of settlements fails increased. These collateral shortages helped provide an impetus for the Reserve Bank to change the way the payment system was liquefied (see section 7 for details).

Offshore holders of New Zealand government bonds wishing to increase their holdings may use the repo market to fund the purchase, or can alternatively enter the foreign exchange market to access New Zealand dollars directly. Offshore investors that do not rely on leverage tend to switch between these markets depending on which offers the cheaper rate. The cost of raising New Zealand dollars through foreign exchange markets spiked a number of times between October 2011 and November 2012 (see figure 12). The wider spread between the repo and foreign exchange forward rates is another factor that has contributed to the periodic surges in repo activity during these periods, along with elevated appetite for New Zealand government bonds among offshore investors.

7 Reserve Bank participation in NZ repo markets

The Reserve Bank is a major participant in the repo market and has, at times, contributed substantially to total market turnover (see figure 13). The bulk of Reserve Bank activity is due to its liquidity management operations, although the Bank also offers a Bond Lending Facility and an Overnight Reverse Repurchase Facility (discussed below).
agreements to withdraw cash from the banking system by selling securities from its holdings in exchange for cash. Conversely, a reverse repo is used to inject cash into the banking system by purchasing repo-eligible securities.

The Bank was very active in this market before 2004 because it used OMOs as its primary tool for liquidity management.

During the early part of the last decade, persistent government budget surpluses introduced significant challenges for managing system liquidity because it resulted in large amounts of cash leaving the banking system. These flows, which were effectively a drain on liquidity, were offset by increased Reserve Bank injections. At the same time, it became increasingly difficult to inject large amounts of cash due to collateral shortages as the Government reduced its issuance of securities. As a result, the Bank began increasingly to use foreign exchange swaps for its liquidity smoothing operations.

Pressures were also seen in the payment system. From 1998, when the Real Time Gross Settlement (RTGS) system was introduced until 2006, banks used the Reserve Bank’s automated repurchase facility called Autorepo to obtain intra-day liquidity.\(^\text{13}\) Repo transactions within Autorepo predominantly used government securities as collateral, with limited quantities of private sector securities. However, the diminishing supply of new government securities became a constraint on the payment system. This was reflected in a widening spread between the bank bill and Treasury bill rates (see figure 14). Another indicator of market stress was the increasing number of failures of tightly timed back-to-back settlements of securities, in which an initial failure caused a chain of subsequent fails.

As a result of these issues the Reserve Bank introduced a ‘cashed-up’ payment system between July and October 2006. Trading banks were able to hold a lower volume of repo-eligible securities, with the subsequent decline in demand for Treasury bills causing the bank bill-Treasury bill spread to tighten back to more ‘normal’ levels, at least until the onset of the GFC. Among other things, the new system meant the Bank had to rely almost entirely on foreign exchange swaps to manage fluctuations in system liquidity.

The Reserve Bank opened its Bond Lending Facility in July 2005. Banks can use this facility to borrow specific government bonds using reverse repo agreements. It was introduced in response to evidence of uncooperative behaviour in the market, as the supply of bonds declined in the early 2000s.

During this period some bondholders were able to buy enough of a specific bond to gain control of the repo rate for that bond, in effect cornering the market. Participants urgently requiring such a bond could be forced to accept a lower rate of return on cash lent in exchange for the bond, allowing the bondholder to borrow cash using repos at a cost significantly below the prevailing market rate. In addition, to retain control of the rate, the bondholder would repo out some of these bonds to the Reserve Bank for cash. This would effectively remove the bond from the market, keeping the repo rate suppressed.

The aim of the Bond Lending Facility is thus to prevent a shortage in a particular bond and the subsequent settlement failures that can occur. The Reserve Bank also introduced limits on the amount of a particular security it

\(^{13}\) Nield, I (2006), “Changes to the liquidity management regime”, Reserve Bank of New Zealand Bulletin, Volume 69 (4). Note that repos in the Autorepo facility were only included in the repo activity figures only before 2002.
would accept as collateral for the purpose of repo lending, to reduce the scope for a bondholder to keep a bond out of the market.

The Reserve Bank's Overnight Reverse Repurchase Facility (ORRF) allows approved market participants to access cash on demand. The aim of this facility is to cap the cost of raising cash at the ORRF rate of 50bp above the OCR. If the cost of borrowing overnight cash in the market is higher than this, it will be cheaper for participants to use the ORRF.

Figure 15 shows repo and outright turnover in government bonds with Reserve Bank activity stripped out of the aggregate figures. Compared to figure 9, this shows a tighter association between turnover in the repo and outright bond markets. However, the recovery in outright bond turnover since mid-2010 still does not match the gains in repo turnover. One reason for this could be that the Reserve Bank's liquidity policy, which took effect from April 2010, has had a dampening effect on outright sales but not on repos. The policy requires banks to retain a higher volume of government bonds on their balance sheets.

Figure 15
Government bond turnover excluding Reserve Bank repo activity

![Graph showing government bond turnover excluding Reserve Bank repo activity](image)

Source: Reserve Bank of New Zealand

However, strong precautionary demand for high-grade assets and the less orthodox approach of major central banks in adding vast quantities of government debt to their balance sheets is locking up large volumes of high-grade assets. The reduction in available collateral may not only dampen activity in repo markets, it could also impede the process of credit creation, resulting in a significant tightening of money supply. This is because financial institutions often re-use collateral that their counterparties have posted with them, to support their own deals. An asset used as collateral can be churned (rehypothecated) several times. For this reason, any reduction in collateral may have a disproportionate impact on credit.

Changes are likely in the global regulatory framework. Regulators in Europe and the US now see the repo market as systemically important. They want to find ways to ensure that secured short-term funding markets will remain open, regardless of market conditions. For instance, the Federal Reserve Bank of New York has pushed for the creation of an independent clearing house to act as a back-stop to repo markets. This could help avoid transaction failures that can exacerbate fears during periods of stress, and could also improve market transparency by making centrally collected data available. Other suggestions include regulatory minimum standards on the quality of collateral used, and officially-set minimum haircuts.

In New Zealand, repo market activity is likely to remain firm in the near term. Repo market turnover will be supported by further growth in eligible collateral as the net issuance of new government bonds continues. In addition, banks are likely to continue relying more heavily on secured markets for liquidity management, given that their holdings of government securities have risen in accordance with the Reserve Bank's liquidity policy.

The New Zealand Financial Markets Association has approached the NZDMO and Reserve Bank about how they could help develop the market for longer-term repos. The Bank is currently considering how it might be able to assist with this, given that the development of a term repo facility would be consistent with the Bank's aim to support the development of New Zealand capital markets.

8 The outlook for the repo market

Globally, repo markets have shown signs of revival, after a period of steady decline following the crisis. Heightened concerns around counterparty risk will continue to support repo market activity due to the lower credit risks associated with collateralised lending.
9 Summary and conclusions

Repo markets in New Zealand play an important role in enabling the banks to manage short-term fluctuations in their cash positions. Repo markets in New Zealand and overseas have recovered over the past few years. Offshore markets were a key channel through which the global funding crisis was transmitted. However, New Zealand repo markets largely avoided the problems that amplified the scale of the economic downturn. A number of factors reduce the scope for pro-cyclicality in New Zealand repo markets. These include:

- a low level of leveraged position taking
- a very high proportion of low-risk collateral
- established regulatory oversight of key participants

As a result, we do not believe the New Zealand repo market poses a systemic risk to the wider financial system. However, we will continue to monitor developments in this market.

Bibliography


Recent trends and developments in currency 2011/2012

Glenys Jacobson

This article looks at trends and developments in New Zealand’s currency over the year to June 2012. The total value of currency in circulation has continued to grow, as it has over the past several years. Every denomination of banknote and coin has seen increases, although at varying rates. The Reserve Bank undertakes note processing to maintain a high quality of notes in circulation. New Zealand has a low rate of counterfeiting by international standards, and the level of counterfeiting has fallen this year.

1 Introduction

The Reserve Bank has the sole right to issue currency (banknotes and coins) in New Zealand. Maintaining the supply, quality and integrity of the currency is one of the Reserve Bank’s core functions. To fulfil this function, the Reserve Bank closely monitors trends in the demand for notes and coins, and undertakes banknote processing operations to maintain the quality, and to check the authenticity, of notes in circulation.

This article looks at trends and developments in New Zealand’s currency. Section 2 looks at the growth in currency in circulation as a whole, sections 3 and 4 look at the composition of, respectively, banknotes and coins in circulation, and section 5 covers the note-processing function of the Bank. Section 6 discusses the level of counterfeiting in New Zealand, and section 7 summarises.

2 Currency in circulation

Currency in circulation comprises notes and coins held by the general public (businesses and households), and held by banks and other financial institutions. Figure 1 shows that currency in circulation has grown steadily over the last several years. Figure 1 also illustrates the peak in demand at Christmas each year when banks order additional cash from the Reserve Bank to meet their customers’ needs. In the year to June 2012, total currency in circulation grew by 4.9 percent, as shown in table 1 below, and as at 30 June 2012 the value of currency in circulation was $4.4 billion. Of this total, the general public held $3.8 billion and banks held $580 million. Total currency in circulation has risen by 30 percent over the last five years, currency held by the general public has grown by 32 percent and that held by banks has grown by 18 percent.

Table 1

<table>
<thead>
<tr>
<th></th>
<th>General public</th>
<th>General public - annual growth</th>
<th>Banks</th>
<th>Total</th>
<th>Total - annual growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jun-07</td>
<td>2,871</td>
<td></td>
<td>490</td>
<td>3,360</td>
<td></td>
</tr>
<tr>
<td>Jun-08</td>
<td>2,948</td>
<td>2.7%</td>
<td>499</td>
<td>3,447</td>
<td>2.6%</td>
</tr>
<tr>
<td>Jun-09</td>
<td>3,328</td>
<td>12.9%</td>
<td>594</td>
<td>3,922</td>
<td>13.8%</td>
</tr>
<tr>
<td>Jun-10</td>
<td>3,374</td>
<td>1.4%</td>
<td>564</td>
<td>3,937</td>
<td>0.4%</td>
</tr>
<tr>
<td>Jun-11</td>
<td>3,583</td>
<td>6.2%</td>
<td>588</td>
<td>4,171</td>
<td>5.9%</td>
</tr>
<tr>
<td>Jun-12</td>
<td>3,793</td>
<td>5.9%</td>
<td>580</td>
<td>4,374</td>
<td>4.9%</td>
</tr>
<tr>
<td>5 year growth1</td>
<td>32%</td>
<td>5.7%</td>
<td>18%</td>
<td>30%</td>
<td>5.4%</td>
</tr>
</tbody>
</table>

1 The 5 year growth figure for General Public, Banks & Total is the total growth rate over 5 years. For General Public – Annual Growth and Total – Annual Growth the figure is the average annual growth over 5 years.
Composition of banknotes in circulation

Figure 2 and table 2 show the composition of banknotes in circulation at 30 June 2012. Figure 2 shows the number of notes and value of notes in circulation by denomination. The $20 note has the largest share of notes in circulation at 43.8 percent. However, the $50 note saw the largest growth in value over the year to June 2012, at 7.9 percent, and has continued to increase its share of notes in circulation by number, now accounting for 15.2 percent.

Table 2 gives figures for the number and value of notes in circulation by denomination at 30 June 2012. In June 2012, 136.6 million banknotes were in circulation with a combined face value of $4 billion. The value of notes in circulation has grown on average by 4.8 percent per year for the last five years.

Composition of coins in circulation

Table 3 shows the number and face value of coins in circulation at the end of June 2012. The face value of coins in circulation was $320 million, an increase of 5 percent on the June 2011 figure. This figure represents almost 8 percent of all currency in circulation. In the year to June 2012, the Reserve Bank issued 52 million coins.
The most popular coin in circulation is the 10 cent coin, and this is also the coin with the fastest growth rate in demand, at 9.3 percent over the 12 months to June 2012.

5 Banknote processing

Another key function of the Reserve Bank’s currency department is to maintain a high quality of notes and coins in circulation. It is important that banknotes are of a good quality to protect against counterfeiting. If banknotes were of a lower quality it would be more difficult for the general public to distinguish a counterfeit from a poor quality genuine banknote. To ensure a high quality of banknotes the Reserve Bank processes notes using a high-speed note-processing machine. The note-processing machine will sort low quality notes and destroy them automatically. The machine can also authenticate banknotes, acting as an important check for counterfeits.

In the year to June 2012, banks repatriated 70.5 million surplus and unfit notes to the Reserve Bank. Of these, more than 27 million notes were processed by the note-processing machine. Over this period the Bank destroyed 18 million notes which were deemed to be below the Reserve Bank’s quality standard.

Banknotes are destroyed when they show signs of ink wear, staining, soiling, graffiti, or structural damage such as tears, holes, heat damage or missing corners. Table 4 shows destruction rates of the current polymer notes in comparison to those of the previous paper notes. Polymer notes have a far lower destruction rate than paper notes and hence have a longer life in circulation. Table 4 shows that in the year to December 1998, as an example, the Reserve Bank destroyed 60.9 percent of the paper notes in circulation at that time; while in the year to June 2012, the Reserve Bank destroyed only 13.9 percent of notes in circulation.

$10 notes were destroyed at the highest rate over this period (25.1 percent of notes in circulation), as they are circulated frequently, passing through many hands and cash registers, causing their quality to deteriorate more quickly. The $5 note is even more subject to deterioration and was the second most-destroyed note in the 12 months to June 2012 (19.5 percent of notes in circulation). It has a lower annual destruction rate than the $10 note, despite being the lowest denomination banknote in New Zealand. This is because $5 notes tend to circulate between members of the public and retailers, who do not return

Table 3
Number and value of coins in circulation – June 2012

<table>
<thead>
<tr>
<th>Coin</th>
<th>Number (000)</th>
<th>Value $(000)</th>
<th>Annual growth in value over 2011/2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>10c</td>
<td>193,020</td>
<td>19,302</td>
<td>9.3%</td>
</tr>
<tr>
<td>20c</td>
<td>167,726</td>
<td>33,545</td>
<td>7.7%</td>
</tr>
<tr>
<td>50c</td>
<td>74,021</td>
<td>37,011</td>
<td>6.9%</td>
</tr>
<tr>
<td>$1</td>
<td>84,389</td>
<td>84,389</td>
<td>4.7%</td>
</tr>
<tr>
<td>$2</td>
<td>73,115</td>
<td>146,231</td>
<td>3.6%</td>
</tr>
<tr>
<td>Total</td>
<td>592,271</td>
<td>320,478</td>
<td>5.0%</td>
</tr>
</tbody>
</table>

Table 4
Destruction of polymer notes from July 2011 to June 2012 and of paper notes in 1998

<table>
<thead>
<tr>
<th>Notes destroyed (000)</th>
<th>$5</th>
<th>$10</th>
<th>$20</th>
<th>$50</th>
<th>$100</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polymer notes destroyed (2011-2012)</td>
<td>3,573</td>
<td>3,981</td>
<td>8,563</td>
<td>1,517</td>
<td>400</td>
<td>18,034</td>
</tr>
<tr>
<td>Average polymer notes in circulation</td>
<td>18,360</td>
<td>15,857</td>
<td>60,643</td>
<td>20,366</td>
<td>14,763</td>
<td>129,989</td>
</tr>
<tr>
<td>Notes destroyed as % in circulation</td>
<td>19.5%</td>
<td>25.1%</td>
<td>14.1%</td>
<td>7.5%</td>
<td>2.7%</td>
<td>13.9%</td>
</tr>
<tr>
<td>Paper notes destroyed (1998)</td>
<td>7,871</td>
<td>12,599</td>
<td>18,024</td>
<td>1,951</td>
<td>870</td>
<td>41,315</td>
</tr>
<tr>
<td>Average paper notes in circulation</td>
<td>11,592</td>
<td>12,300</td>
<td>32,092</td>
<td>7,275</td>
<td>4,575</td>
<td>67,834</td>
</tr>
<tr>
<td>Notes destroyed as % in circulation</td>
<td>67.9%</td>
<td>102.4%</td>
<td>56.2%</td>
<td>26.8%</td>
<td>19.0%</td>
<td>60.9%</td>
</tr>
</tbody>
</table>
them to their banks but keep them as change. Therefore, poor quality $5 notes are not returned to the Reserve Bank to be destroyed as soon as they should be, leading to a lower quality of notes in circulation. The $100 note is the note which is destroyed the least. Over 2011/2012, 2.7 percent of $100 notes in circulation were destroyed. The $100 note is used mainly as a store of value rather than for transactions and hence its quality does not deteriorate as quickly as other denominations.

6 Counterfeiting
The third objective of the Reserve Bank’s currency function is to maintain the integrity of the currency. The rate of counterfeiting is measured internationally by recording the amount of counterfeits found per million notes in circulation. The Reserve Bank has a target to have less than 10 counterfeits per million notes in circulation. Figure 3 shows the amount of counterfeits per million found in New Zealand over the last 10 years. In the year to June 2012 the rate of counterfeiting was 1.0 per one million notes in circulation.

The Reserve Bank discovers counterfeits in three ways: from note processing by cash-in-transit companies, from the Reserve Bank’s own note processing, and from the police. The police either receive counterfeits passed on to them by members of the public, or they may come across them while performing their duties.

Figure 3 shows the level of counterfeiting in New Zealand over recent years. This rate has fallen to 1.0 per million notes in circulation over 2011/2012, from 3.0 per million in the previous year. The counterfeit level in New Zealand is low in comparison to international levels. It should be noted that this figure is likely to be understated, as not all counterfeits will be found by, or passed on to, the Reserve Bank or the police. The public are encouraged to inspect notes they suspect are not authentic. There are several security features that can be checked. The easiest feature to check is the embossed window: if the note is genuine, the window shows the value of the note, and no edges can be felt at the border of the window.

Although there is a very low counterfeiting rate in New Zealand, the Reserve Bank is committed to keeping the rate low and increasing the quality of notes in circulation. After around 15 years, it is now time to upgrade our banknote security features with a new series of notes scheduled to be progressively released from late 2014 at the earliest.

Figure 3 Counterfeits per million notes in circulation

7 Summary
Banknotes and coins remain an important means for making transactions in New Zealand. Currency in circulation continues to rise despite the increasing use of electronic payments. The Reserve Bank continues to satisfy the demand for currency, and note quality proves generally satisfactory. The Reserve Bank ensures that the needs for New Zealand’s legal tender are met by supplying good-quality banknotes and coins and maintaining the currency’s integrity.
Financial accounts and flow of funds

Phil Briggs

This article briefly describes the structure of sectoral accounts for the economy under the framework of the System of National Accounts. It outlines a Reserve Bank work programme to support the development of financial accounts and flow of funds analysis. These accounts would enhance our understanding of financial behaviours and inter-sectoral relationships within the economy. The article also discusses the development of a full household sector balance sheet and presents estimates for a number of items that are not currently covered in the Reserve Bank’s published tables of household assets. New experimental estimates of the equity held in unincorporated businesses, and households’ equity in unlisted incorporated businesses add around $170 billion to previously published estimates of household assets.

1 Introduction

The Reserve Bank is currently redeveloping its statistical collections from financial institutions. These redevelopments are partly being driven by the need to collect additional data on the soundness of financial institutions and the financial system. However the Bank will also be aiming to make its redeveloped surveys consistent with the requirements of the System of National Accounts (SNA). The data from these surveys can be used in the production of financial accounts and flow of funds tables for New Zealand.

Financial accounts show net transactions in financial assets and liabilities for each sector of the economy. Summing the net transactions for assets and subtracting the net transactions for liabilities gives the net change in financial position for a sector. This net change figure, as we will see later, can be used as a check on the accuracy of the estimated saving for the sector.

A flow of funds approach takes the analysis further, showing financial claims between sectors, and the net transactions between them. Flow of funds tables show ‘who borrows from whom’. They therefore show the financial exposure of each sector to other sectors, where one of these other sectors is ‘the rest of the world’.

The Bank’s survey redevelopment work is being undertaken in close consultation with Statistics New Zealand to ensure that the survey data meets, as far as possible, the requirements of the latest United Nations (UN) guidelines for the preparation of national accounts – the SNA08 manual.1

This article outlines the structure of SNA sector accounts, and briefly describes financial accounts and flow of funds tables. The article also outlines the work that the Reserve Bank is planning in this area. Finally it looks at how a full SNA balance sheet for the New Zealand household sector might be assembled, and produces experimental estimates for some of the items that are currently missing from the Reserve Bank’s tables on household assets and liabilities.

2 Sector accounts

In the national accounts, economic entities – or, more formally, institutional sector units – are grouped into sectors based on the nature of the economic activity that they undertake. In general, there are five sectors within the domestic economy:

• The non-financial business sector
• The financial business sector
• The general government sector
• The non-profit institutions serving households sector
• The household sector.

However, these sectors are often split into subsectors. For example, non-financial businesses can be broken down into private corporations, private unincorporated businesses, and government enterprises. The sectoral data that Statistics New Zealand (SNZ) currently produces use a total of nine domestic sectors or subsectors.2

1 UN et al (2009).

2 These cover: private corporate businesses, private non-corporate businesses, central government enterprises, local government enterprises, financial intermediaries, central government, local government, households and private non-profit organisations serving households.
SNZ also uses a sector to cover ‘Rest of world’, which includes overseas entities that have dealings with New Zealand entities. SNZ is currently reviewing its institutional sector classification. The review is likely to result in a classification that aligns closely with SNA08.

Sectoral data are generally used to look at a sector’s income, expenditure, saving, investment, funding, and borrowing and lending. These items relate to economic flows. Sectoral data can also be produced for economic stocks, such as assets and liabilities, which show how wealth is being accumulated.

In the SNA a sequence of inter-related accounts is produced for each sector, and these are shown in diagrammatic form in figure 1. We will look initially at the first three accounts in the centre of the diagram, which show economic flows over a particular time period, say a year:

- The production account shows components of the sector’s GDP. These components are for the income measure of GDP. One of these components – operating surplus – is used in the next account.
  - In the income and outlay account, other income, such as interest receipts and government transfers, is added to operating surplus. Income is then adjusted to account for various payments, such as interest and tax. The residual, after an adjustment to account for depreciation in the sector’s capital stock, is saving, which is used in the next account.
  - The capital account shows the funding of capital expenditure – of which saving is a major component – and expenditure on capital items, which includes spending on land, buildings and plant. Funding less expenditure equals ‘net lending’. If a sector’s net lending is positive then it has funds that it can lend to other sectors. Alternatively, the sector can use these funds to pay off its debt. Either way, the sector’s net financial assets will increase. If net lending is negative then the sector’s net financial assets will decrease.

We turn now to the financial account, which also shows economic flows over a time period. These flows are for ‘net transactions’ in various types of financial assets.

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**Figure 1**
Sequence of sector accounts

```
Opening Balance Sheet → Capital Account → Financial Account → Closing Balance Sheet

Assets – Liabilities = Wealth
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* In contrast to sectoral data, industry data – which are based on ANZSIC classification system – focus generally on production and investment.
and liabilities. In general terms, a sector’s net transactions for a particular asset type will equal its acquisitions of that asset, less its disposals of that asset. However, for interest bearing assets, the accrued income for the asset over the period also needs to be included.\(^5\) Net transactions in financial liabilities are calculated in a similar fashion. In summary the financial account shows the financial flows going into, or out of, all types of financial assets and liabilities. The sum of the flows into financial assets minus the sum of the flows into financial liabilities is the ‘net change in financial position’ for the sector. This figure shows the sector’s net acquisition of financial assets. It should be equal to the net lending figure from the capital account. As outlined above, net lending should result in a corresponding change in net financial assets.

In practice, ‘net lending’ and ‘net change in financial position’ are usually not exactly the same, owing to difficulties in producing accurate estimates of each measure. Nevertheless, an estimate for ‘net change in financial position’ provides a useful check on the estimate for ‘net lending’. The estimate for ‘net change in financial position’ can also be used, in conjunction with estimated expenditure on capital items, to derive an alternate value for saving.\(^6\)

So far we have looked at flows. But Figure 1 also shows the sector’s balance sheet at the start of the period and the balance sheet at the end of the period, and these balance sheets cover stocks of assets and liabilities. The closing balance sheet can be derived from the opening balance sheet by adding in the flows from the capital account, financial account, and the ‘reconciliation’ accounts. The reconciliation accounts show the effects of asset revaluations and ‘other changes in the volume of assets’ (OCVA). OCVA accounts for one-off changes in volumes like defaults on loans or the unexpected destruction of capital stock.

So for each type of asset, the difference between the final stock and the opening stock is equal to the sum of three flows: net transactions, revaluations, and OCVA. Figures for these flows, as well as figures for opening and closing stocks, are often obtained through surveying enterprises. However, sometimes only balance sheet data – that is, stock data – are available. In these cases an asset price index is often used to estimate revaluations, with a simple assumption being made about OCVA (usually that it is zero). Net transactions are then calculated as a residual.

**Flow of funds tables**

As we have seen, financial accounts show a sector’s net transactions for each type of financial asset or liability. Flow of funds tables go further than this; for each type of asset or liability they provide a breakdown of net transactions by counterparty sector. So for a sector that has increased, for example, its net loan liabilities, it is possible to see the changes in net liabilities against each counterparty sector.

Flow of funds tables sometimes contain data on stocks as well as flows. These show, for example, a sector’s loans, broken down by the sector that is providing the loans. These stock tables are perhaps even more useful than the tables for net transactions since for each sector they show that sector’s financial exposures to other sectors, including the rest of the world.

Flow of fund tables are often referred to as ‘whom-to-whom’ tables. For example, a table can be prepared showing stocks of short-term debt securities. The rows of the table would show the sectors that issued the securities, while the columns would show the sectors holding these securities.

Flow of funds data can also be presented via a ‘plumbing diagram’, which shows the links between sectors. For example, figure 2 shows a diagram for net financial claims between sectors of the Australian economy.\(^7\) The arrows in figure 2 run from the sector which has the net claim to the sector on which the net claim is made.

\(^5\) Accrued interest is interest which has been earned, but for which no payment has yet been received. Hence it does not yet appear in the transaction data, and needs to be accounted for. See IMF (2008), p103, for definitions of net transactions by asset/liability type.

\(^6\) See Hodgetts et al (2006), which uses RBNZ data on the financial assets of the household sector to back out an alternative estimate of household saving.

\(^7\) A sector – suppose we call it sector A – will have a financial claim on another sector – say sector B – if it has lent money to sector B or if it holds equity in sector B. Sector A will have a net financial claim on sector B if its financial claims on sector B are greater than sector B’s financial claims on sector A.
One point to note: since one sector’s liabilities are assets for counterparty sectors, it is necessary when compiling flow of funds data to use the same financial instrument categories for both liabilities and assets. SNA08 recommends a classification system that starts with assets that have a high degree of liquidity and ends with assets that have a low degree of liquidity.8

An interesting feature of figure 2 is that in Australia the household sector has a large net financial claim on financial corporations. This is despite a high level of mortgage borrowing by the household sector, most of which comes from financial corporations. The major component of the household sector’s high level of net claims on financial corporations is its accumulated wealth in superannuation funds.

Figure 2
Net financial claims between sectors of the Australian economy at the end of June quarter 2012, $A billion

Producing financial accounts and flow of funds tables for New Zealand

SNZ has produced institutional sector accounts for the 1999-2009 period. These accounts are for March years. As noted earlier they cover nine domestic sectors, with another sector for the rest of the world. Each domestic sector table covers the production account, the income and outlay account, and the capital account. The rest of the world table includes the income and outlay account, and the capital account. Sectoral financial accounts, balance sheets and reconciliation accounts are not currently being produced.

The Savings Working Group, which reported to Government in January 2011 recommended that a full set of SNA accounts – including financial accounts, balance sheets and reconciliation accounts – be produced for each sector.9 Furthermore, at a workshop on national accounts and financial statistics held at the Reserve Bank in June 2011, there was general support for the development of a

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8 The major instrument groups, in order of liquidity, are: monetary gold and SDRs, currency and deposits, debt securities, loans, equity and investment fund shares, insurance and pension schemes, financial derivatives and employee stock options, other accounts receivable or payable.

full set of sectoral accounts.  

Since the workshop, the Bank and SNZ have been reviewing various data sources, with a view to assessing whether financial accounts and flow of funds tables could be produced. The focus has been on looking at balance sheet data for the financial sector and the household sector. In light of this review work, the Bank’s statistics unit has established a programme of work related to financial accounts. This includes redeveloping the Bank’s statistical surveys and outputs so that they meet the requirements of the IMF’s monetary and financial statistics manual (MFSM) and also SNA08.  

MFSM is consistent with SNA08 although SNA08 specifies more subsectors. The work will focus on:

- The Reserve Bank’s balance sheet. An MFSM version of the Bank’s balance sheet will be published on the Reserve Bank’s website shortly.
- Redeveloping the Reserve Bank’s standard statistical return (SSR), which is a survey of the balance sheets and related financial data of registered banks and non-bank financial institutions.
- Redeveloping the managed funds survey (MFS), which is a survey undertaken in conjunction with SNZ. This survey will be brought into line with the requirements of the latest version of the international balance of payments manual (BPM6).
- Implementing a new balance sheet survey of insurance companies. A starting date for this is still to be confirmed.
- Expanding the Reserve Bank’s estimates of households’ assets and liabilities. Additional items will need to be added to the present data if an SNA-type balance sheet for the household sector is to be produced. The next section of this article outlines initial work in this area.

The ideal situation would be to produce financial accounts and flow of funds tables on a quarterly basis, as in Australia. The redevelopment work on surveys will be focusing on collecting quarterly data. However, it is likely that any initial versions of financial accounts and flow of funds tables will be annual, and for March years. These accounts would be consistent with the institutional sector accounts already being produced.

3 Household balance sheet

The Reserve Bank already publishes estimates of many of the major items of the household balance sheet on its website. However, as the website notes, a number of major balance sheet items are not covered by these statistics. The largest missing items include equity in unincorporated businesses, and shares in unlisted incorporated businesses.

Table 1 shows a balance sheet for the household sector which, in the main, is based on items from the Reserve Bank’s published tables. However, these items have been regrouped and rearranged so that they fall under the financial instrument categories used in SNA08. Also, table 1 includes estimates for equity in unincorporated businesses, and shares in unlisted incorporated businesses. These estimates should be regarded as being experimental only, and are not official Reserve Bank estimates.

Households’ equity in unincorporated businesses

Unincorporated businesses are not limited liability companies but are instead owned directly by households. They include sole proprietorships, partnerships and trusts. These could generally be seen as being part of the household sector. However, some of these unincorporated businesses...

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10 See Briggs and Barrow (2011) for a summary account of the workshop. Presentations from the workshop can be downloaded from: http://www.rbnz.govt.nz/research/workshops/13jun2011/index.html


12 The items that are listed as not being covered are: equity in farms, equity in unincorporated businesses, shares in unlisted incorporated businesses, equity in directly-held commercial property, direct ownership of assets such as forests, consumer durables, overseas property owned by New Zealand residents, non-equity overseas financial assets, notes and coin held by households.

13 While the estimates presented here are ‘experimental’, the ultimate aim is to produce estimates that can be included in the Bank’s website tables. We would also aim to fully document the methodologies used in producing these estimates and make this documentation available.
enterprises operate reasonably independent of households in that they are able to produce a full set of accounts for their business. The practice in New Zealand has been to take these unincorporated enterprises for which accounts can be compiled and to include them in an 'unincorporated' sector rather than the household sector. Our task therefore has been to estimate the equity of this unincorporated sector with a view to including the equity on the household balance sheet.

We have based our estimates of the equity in unincorporates on data from SNZ's annual enterprise survey (AES). However, we have had to adjust the AES data to exclude assets and liabilities that are already being accounted for by Reserve Bank data. AES data for unincorporates cover a number of family trusts. The financial assets of these trusts are already captured in Reserve Bank surveys since in these surveys all family trusts are treated as being part of the household sector.

Table 1
Household balance sheet 2007-2011

<table>
<thead>
<tr>
<th>Assets, $m</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currency (notes and coins)</td>
<td>1,472</td>
<td>1,519</td>
<td>1,700</td>
<td>1,761</td>
<td>1,827</td>
</tr>
<tr>
<td>Deposits</td>
<td>87,401</td>
<td>95,757</td>
<td>104,061</td>
<td>105,321</td>
<td>110,508</td>
</tr>
<tr>
<td>Debt securities</td>
<td>9,641</td>
<td>11,893</td>
<td>14,319</td>
<td>15,015</td>
<td>14,832</td>
</tr>
<tr>
<td>Long term loans</td>
<td>810</td>
<td>730</td>
<td>786</td>
<td>765</td>
<td>670</td>
</tr>
<tr>
<td>Equity and investment fund shares:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quoted shares in resident enterprises</td>
<td>18,956</td>
<td>14,467</td>
<td>11,240</td>
<td>15,274</td>
<td>15,870</td>
</tr>
<tr>
<td>Quoted shares in non-resident enterprises</td>
<td>7,834</td>
<td>7,119</td>
<td>5,008</td>
<td>7,173</td>
<td>7,514</td>
</tr>
<tr>
<td>Unquoted shares in resident enterprises:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equity in unincorporated enterprises (1)</td>
<td>78,000</td>
<td>84,000</td>
<td>84,000</td>
<td>88,000</td>
<td>90,000</td>
</tr>
<tr>
<td>Equity in unlisted corporates (1) (2)</td>
<td>78,000</td>
<td>69,000</td>
<td>74,000</td>
<td>77,000</td>
<td>77,000</td>
</tr>
<tr>
<td>Unit trusts and group investment funds</td>
<td>33,071</td>
<td>30,250</td>
<td>27,735</td>
<td>30,109</td>
<td>29,980</td>
</tr>
<tr>
<td>Insurance and pension funds:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life offices</td>
<td>8,351</td>
<td>7,321</td>
<td>6,302</td>
<td>6,195</td>
<td>5,842</td>
</tr>
<tr>
<td>Superannuation funds</td>
<td>22,494</td>
<td>21,913</td>
<td>19,323</td>
<td>25,442</td>
<td>29,488</td>
</tr>
<tr>
<td>Unfunded superannuation claims</td>
<td>6,887</td>
<td>7,983</td>
<td>8,809</td>
<td>9,703</td>
<td>10,102</td>
</tr>
<tr>
<td>Total financial assets</td>
<td>352,917</td>
<td>351,952</td>
<td>357,283</td>
<td>381,758</td>
<td>393,633</td>
</tr>
<tr>
<td>Fixed assets (housing stock)</td>
<td>587,000</td>
<td>616,000</td>
<td>568,000</td>
<td>609,000</td>
<td>605,000</td>
</tr>
<tr>
<td>Total assets</td>
<td>939,917</td>
<td>967,952</td>
<td>925,283</td>
<td>990,758</td>
<td>998,633</td>
</tr>
<tr>
<td>Total assets as a percentage of nominal GDP</td>
<td>553%</td>
<td>526%</td>
<td>499%</td>
<td>522%</td>
<td>502%</td>
</tr>
</tbody>
</table>

| Liabilities | | | | | |
| Short term loans (3) | 13,776 | 14,377 | 13,992 | 13,426 | 13,213 |
| Long term loans: | | | | | |
| Housing loans | 142,893 | 158,719 | 163,198 | 168,449 | 170,672 |
| Student loans | 8,370 | 7,413 | 9,573 | 10,259 | 11,145 |
| Total liabilities | 165,039 | 180,509 | 186,763 | 192,134 | 195,030 |
| Total liabilities as a percentage of nominal GDP | 97% | 98% | 101% | 101% | 98% |
| Net worth | 774,878 | 787,443 | 738,520 | 798,624 | 803,603 |
| Net worth as a percentage of nominal GDP | 456% | 428% | 398% | 421% | 404% |

(1) Experimental estimates
(2) An estimate for 2011 not available; the 2011 value is assumed to be the same as for the previous year.
(3) Consumer loans are used as a proxy for short term loans; all other loans are assumed to be long term.

Sources: Reserve Bank of New Zealand, QV
Also, the housing assets and housing debt of these trusts have already been accounted for in the Reserve Bank’s published data on housing assets and debt, which is also the data used in table 1. Furthermore, AES covers other unincorporates besides family trusts. Some of these will also have housing assets and debt and, again, these will have already been accounted for by the Reserve Bank data.14

We therefore estimated:

• the housing assets and housing debt that incorporates in AES hold, and
• the financial assets that family trusts in AES hold.

We then subtracted these assets and liabilities from the AES totals, and calculated the remaining equity (as assets minus liabilities). This is our estimate of the equity households hold in unincorporated businesses.

Estimating the housing assets and housing debt held by unincorporates in AES is not straightforward, and a number of assumptions had to be made in doing this. In view of this, the final estimates shown in Table 1 should be regarded as indicative only.

Given that our estimates have been derived from AES data, they are for ‘book values’ of unincorporates. That is, they cover ‘shareholders’ equity and reserves’, where for each business this is taken to be equal to total assets minus total liabilities. Ideally any estimates of business equity would reflect ‘market values’ – this is, the values that the businesses would fetch if they were sold. However, it is likely that many unincorporates could not in fact be sold as going concerns, and that only their physical assets could be sold. In these cases, book values would be a reasonably accurate reflection of market values.

Households’ equity in unlisted corporates

Unlisted corporates are limited liability companies that are not listed on the stock exchange. The equity in these companies can be owned by any of the other sectors: other corporates (both financial and non-financial corporates), unincorporates, government, private non-profit organisations serving households, and the rest of the world.

The household sector’s holdings were calculated as a residual. This involved a number of steps:

• We calculated the total equity that was available in New Zealand enterprises, using data from AES and NZX.
• We added in the equity that New Zealand entities hold overseas, using data from SNZ’s survey of the international investment position (IIP).
• We then looked at who was holding this equity. We estimated the equity held by each sector other than the household sector. These estimates were based on data from AES, government accounts, and the IIP.
• Total equity available minus our estimate of total equity held was taken to be amount held by the household sector. From this we subtracted the equity that is already covered in the published Reserve Bank estimates, such as the domestic shares that are held by households and the equity that they have in unit trusts.

Again, the resulting estimates need to be treated with caution. Any errors in any of the components used in calculating our final estimates will show up in these final estimates. We are unlikely to have a great deal of confidence in our final estimates until we have been able to benchmark them against estimates from other sources, such as a comprehensive household survey of wealth. Nevertheless, our estimates do not seem outlandish, relative to those for other countries.15

As with the estimates of households’ equity in unincorporates, the estimates of households’ equity in unlisted companies are for the book values of companies, rather than market values. As before, this is because the method we have used is based largely on AES data. Converting our estimates of book values to market values is not likely to be straightforward and is an area for further work.

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14 AES specifically excludes the ‘residential property operators’ group, which includes enterprises whose predominant activity is renting out residential properties. Despite this, the enterprises that are included in AES will hold some rental residential properties.

15 The ABS estimate for the equity held by Australian households in unlisted companies in March 2009 is equal to around 35% of GDP; our corresponding estimate for New Zealand households is equal to around 40% of GDP.
Other additional items

Table 1 includes estimates for two other types of assets which have not as yet been included in the Bank’s published tables. These two asset types are currency (holdings of notes and coins) and unfunded equity in superannuation schemes.

Regarding currency, it was assumed that of the currency that is currently held by the public, half is held by the household sector, with the other half being held by other sectors.

Unfunded equity in superannuation refers to superannuation entitlements not covered in full by the amounts that are held in superannuation funds. These unfunded claims largely relate to defined benefits schemes. The figures in table 1 cover only public sector superannuation schemes, and are taken from central government budgets. As yet we have no estimates for the unfunded component of private sector schemes, although such schemes have been reducing in importance over recent decades.

Items still not being covered

Our estimates of equity in unincorporates should cover two other items listed as missing in footnote 12: equity in directly-held commercial property, and direct ownership of assets such as forests. Our estimates of equity in unincorporates will also include most of the equity in farms since the majority of farms are unincorporated enterprises.\(^{16}\)

This leaves only three items from footnote 12 that we have not covered: overseas property owned directly by New Zealand households, non-equity overseas financial assets, and consumer durables.\(^{17}\) Household surveys may be able to provide some useful data on these items. Australian data may also be useful for Overseas assets, given that a significant proportion of overseas assets held by New Zealand residents are likely to be in Australia. This is an area for further work.

Consumer durables include things like house contents, cars, boats, etc. In the SNA, spending on these items is classified as consumption rather than investment. Hence a value for such items held by households is not included on the SNA balance sheet. However these items are, in a sense, the ‘plant and equipment’ of the household sector, and hence there may be some merit in producing estimates for them. In the short term, however, the focus will be on estimating SNA items.

There are also some other items for which we need to make estimates for if the household balance sheet is to be fully compliant with the SNA. These are:

- Other accounts receivable and other accounts payable. Accounts receivable will include tax rebates; accounts payable will include tax payments, rent payments, electricity bills, etc.
- Claims on non-life insurance technical reserves. These claims are household sector assets. They include prepayments of insurance premiums and also the financial claims of policy holders that have not yet been settled. The amounts relating to outstanding claims will have risen markedly since the first earthquake in Christchurch.

Table 1 is largely a modified version of the Reserve Bank’s current table of household assets and liabilities. Hence it includes all of the assets and liabilities (mortgages) related to housing.

However, in a strict SNA format the household balance sheet would look a little different. It would not include any of the assets and liabilities of unincorporates, and so would not include, for example, the housing assets and liabilities of unincorporates. These assets and liabilities would instead be on the unincorporates balance sheet. However, the net worth of the household sector would not be affected, and would be the same as that shown in Table 1.\(^{18}\)

\(^{16}\) The remaining equity in farms should be covered by our estimates of households’ equity in unlisted corporations.

\(^{17}\) Examples of non-equity overseas financial assets include direct individual holdings of foreign issued debt securities and New Zealand residents’ assets in overseas superannuation funds.

\(^{18}\) For example, moving some of the housing assets and liabilities to the unincorporates sector would reduce the household sector’s net equity in housing. But this would be offset by a rise in the household sector’s ‘equity in unincorporated enterprises’.
Comments on the expanded household balance sheet

The extra items that we have added to the household balance sheet, especially the items for equity in unincorporates and unlisted corporates, have clearly had a substantial impact on our measure of total assets. This changes how New Zealanders’ holdings of housing assets, which are sometimes seen as totally dominating household assets, might be viewed. As a proportion of the total assets shown in the narrower version of the balance sheet on the Reserve Bank website, housing accounts for 75 percent in 2009. As a proportion of the total assets shown in table 1 housing accounts for around 61 percent in the same year. The situation would change again if we were to consolidate the balance sheet of the unincorporates sector with that of the household sector. In this case, the assets of unincorporates would not be subsumed within the equity figure for unincorporates but would be added directly to the assets for households. Our calculations indicate that in this case, housing would be around 56 percent of total household assets in 2009.

Many countries do not separate unincorporates from the household sector; they simply include the assets and liabilities of unincorporates on the household balance sheet. So their balance sheets are equivalent to a consolidated balance sheet for households and unincorporates. This type of balance sheet is often used when making international comparisons.

4 Conclusion

The production of a full set of financial accounts and flow of funds tables for New Zealand would enhance our understanding of financial behaviours and relationships between institutional sectors in New Zealand. While progress is being made towards that goal, much work remains to be done in getting the data into the shape needed to produce these accounts. The use of an internationally accepted framework – the SNA – should place us in a good position to compare the attributes of New Zealand’s financial system with those of other countries once this work is finally completed. Overall the SNA is likely to provide us with a useful framework for collecting, organising, interpreting and understanding data on the financial system.

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19 Since unincorporates are held directly by households, net transactions in unincorporates’ equity will generally be equal to net transactions in unincorporates’ assets less net transactions in unincorporates’ liabilities. Net transactions for unlisted corporates will be net purchases by households of additional shares in these companies.

20 See Bank of Japan (2012) for a comparison of the Japan with the US and the euro area.
References

http://www.treasury.govt.nz/publications/reviews-consultation/savingsworkinggroup
AN 2012/06
Not a jobless recovery, just a slow one
Rebecca Craigie, David Gillmore and Nicolas Groshenny,

We compare the current recovery in the New Zealand economy with the recoveries from the previous two recessions, focusing on the developments in the labour market. By way of comparison, we contrast the New Zealand situation with that of the United States, during its current and previous two recessions. Our main findings are (1) the current recovery in New Zealand has been slower than following previous recessions; (2) during this period the labour market has been subdued and (3) growth in employment (and hours) has been higher than would normally be expected, given the rate of GDP growth, implying a lack of productivity growth.

AN 2012/07
Risk, return, and beyond: A conceptual analysis of some factors influencing New Zealanders’ investment decisions
Elizabeth Watson

This note presents the data and technical detail underlying a new set of estimates of gross asset returns since 1989 for a wide range of assets relevant to New Zealanders. The estimates have an economy-wide lens. An individual investor is likely to be interested in the realised risk and return they can achieve, as determined by a range of additional factors like taxes or personal circumstances. The analysis presented here is designed to illustrate conceptually the construction of a diversified portfolio and the practical advantage in doing so in a world of considerable uncertainty.

AN 2012/08
Extending the Reserve Bank’s macroeconomic balance model of the exchange rate
James Graham and Daan Steenkamp

The exchange rate matters a lot in New Zealand and the Reserve Bank uses several different models, each imprecise, to analyse it. This note focuses on just one of those approaches: the macro-balance model of the exchange rate. We use that model to estimate the exchange rate which, if sustained, would stabilise at around current levels the negative net international investment position (as a percentage of GDP). The sensitivity of the model estimates to some of the key assumptions is illustrated.

AN 2012/09
Do actual and/or expected OCR changes affect the New Zealand dollar?
Jason Wong and Bevan Cook

This note analyses the relationship between actual and expected Official Cash Rate (OCR) changes and subsequent exchange rate movements. It concludes that there has been a weak positive relationship between OCR changes (or expected changes) and the currency, but that this only applies over very short time periods. Many variables affect the New Zealand exchange rate and previous research has suggested that there are much more dominant drivers of the currency than interest rates, such as commodity prices.

AN 2012/10
Modelling New Zealand mortgage interest rates
Enzo Cassino

Determinants of New Zealand mortgage interest rates are examined, including how changes in the OCR are transmitted through the wholesale cost of funds to mortgage rates. Mortgage rates are modelled as a mark-up over banks’ marginal funding cost. The results suggest that banks frequently diverge from a simple marginal cost-pricing model. Marginal cost pricing of mortgages appears
to hold only in the long run. Floating mortgage rates and short-term fixed rates are closest to showing a full pass-through of changes in marginal costs.

AN 2012/11
Building a picture of New Zealand manufacturing
Gael Price

New Zealand manufacturing activity fell sharply in the 2008/09 recession, and there has been only a modest recovery since then (something seen in other countries too). Exports of (non-primary) manufactured goods have held up relatively well, but domestic production and sales have been weak. Our analysis suggests that the very weak domestic construction sector can explain much of the continued weakness in manufacturing activity.

AN 2012/12
Market perceptions of exchange rate risk
Michelle Lewis

The prices for foreign exchange options allow us to extract information on implied market perceptions of future exchange rate risk. This note illustrates the techniques, looking at the behaviour of the New Zealand dollar over recent years. Our analysis suggests that the behaviour of the NZD/USD market has changed significantly since the global financial crisis. During the crisis, markets became increasingly uncertain and the balance of risks changed significantly with the market placing much more weight on the chance of depreciation than of appreciation. Although volatility in the NZD/USD is currently quite low, the market continues to price significantly more risk of depreciation than of appreciation.
NEWS RELEASES

Reserve Bank Bulletin released
27 September 2012

The Reserve Bank today released the September 2012 edition of the Reserve Bank Bulletin.

The Bulletin’s first article is based on an interview with Alan Bollard who has just completed his second five-year term as Governor of the Reserve Bank. Dr Bollard reflects on his time with the Bank, especially the policy challenges, relationships, and changes in the regulatory framework.

The economic impacts of the Canterbury earthquakes are explored in the Bulletin’s second article. While the Canterbury economy has proved reasonably resilient, some sectors have been hard hit. Repair and rebuild activity is underway and is expected to accelerate, but it will take at least a decade to complete.

Another Bulletin article examines foreign currency reserves, while the fourth article explores asset returns and the investment choices of New Zealanders.

Statistics update: new bank liquidity statistics released
5 October 2012

The Reserve Bank today released a new suite of statistics on the aggregated funding and liquidity position of locally incorporated banks.

Locally incorporated banks are required to comply with the Reserve Bank’s Liquidity Policy, which includes specified minimum ratios for expected cash flows and for ‘core’ funding.

This policy is intended to promote the smooth functioning of the financial system by reducing the likelihood of liquidity problems affecting a registered bank.

A requirement of the Reserve Bank’s Liquidity Policy is that banks must submit monthly reports to the Reserve Bank. These reports cover compliance with the minimum ratios, a breakdown of liquid assets held, comprehensive data on cash inflows and outflows broken down by maturity, details of new funding raised over the latest month, and the cost of that funding. These reports are the source of the summary results now being presented on an industry-wide basis.

The Reserve Bank will publish these summary results monthly, on the dates specified in the Advanced release calendar.

The Reserve Bank’s Liquidity Policy can be found here:

Central banking in a post-crisis world
26 October 2012

Pursuing price stability and financial system stability is the best way that the Reserve Bank can bolster New Zealand’s long-term economic growth, Reserve Bank Governor Graeme Wheeler said today.

In a speech to the Admirals’ Breakfast Club in Auckland, Mr Wheeler said New Zealand should be capable of better economic growth given its tremendous assets. But as a small open economy, it is continually buffeted by external economic and financial shocks.

“New Zealand needs to reverse the slow-down in multifactor productivity growth and the decline in value-added in our tradables sector, and reverse the shift of resources into the public sector and non-traded activities,” Mr Wheeler said.

He noted that large central banks in many advanced countries are operating in new territory with unprecedented policy settings.

“Price stability and financial stability remain the Reserve Bank’s central objectives for monetary policy and prudential policy. These provide the best framework for achieving stronger growth in output and employment in the longer term,” Mr Wheeler said.

“The recent Policy Targets Agreement (PTA) reinforces the importance of price stability, and introduces the goal of keeping future average CPI inflation near the 2 percent mid-point of the 1 percent to 3 percent target range. Over time, attaining this outcome should help to anchor inflation expectations around the mid-point.”

In the wake of the Global Financial Crisis, central bankers and fiscal authorities are now more conscious of potential risks and possible flow-on effects to the banking sector. Mr Wheeler said the Reserve Bank has
placed a high priority on strengthening New Zealand's prudential regime, including introducing macro-prudential instruments and having an Open Bank Resolution capability in place.

He said New Zealand does not require quantitative easing: the economy is growing at an annual rate of around 2 percent, and the Reserve Bank has scope to lower interest rates if needed.

"New Zealand is one of several countries that have experienced upward pressure on its exchange rate in recent years. Ultimately it is the relative rates of return between New Zealand and the rest of the world that explains the strength of the New Zealand dollar," he said.

The Reserve Bank would like to see a lower exchange rate "provided it can be achieved without damaging price and financial stability".

Mr Wheeler said that foreign currency intervention is unlikely to have a sustainable effect on the NZ dollar, although it can have an impact in the short term. The Bank will remain vigilant on its criteria for intervention, and will be prepared to intervene if all its conditions are met.

"In order to achieve a sustained reduction in the New Zealand dollar, it would be necessary to alter the overall level and pattern of saving and investment in the economy. In particular, it will be necessary to tackle our addiction of depending on foreign savings to finance our consumption and investment."

"Monetary policy by itself cannot deliver quick fixes to achieve and sustain more rapid economic growth, lower unemployment, or maintain a lower exchange rate. Other policies are central for achieving these outcomes but when they are applied monetary policy can be supportive of them."

A copy of the speech is available on the Reserve Bank website at http://www.rbnz.govt.nz/speeches/5005204.html

Open Bank Resolution – broadening the Government's options to deal with a bank failure

1 November 2012

Background Feature by Reserve Bank Deputy Governor Grant Spencer.

The global financial crisis has provided a worldwide reminder that banks can fail. It also highlighted the potential size of the financial burden that can be faced when Governments step in to guarantee a nation's banking system. A glaring example of this is Ireland. Bank failures are very rare in New Zealand and we do not expect this to change. In addition, New Zealand's financial system remains stable. Nevertheless, it is important to have robust policies in place to deal with such unlikely, but potentially damaging events.

Open Bank Resolution (OBR) is a process for dealing with a failing bank quickly to enable the bank to re-open for business the next business day.

Without OBR, the options for responding to a bank failure are liquidation, government bail-out or takeover by a competitor. If takeover is not an option, then the Government is left to choose between liquidation and bail-out.

Neither option is appealing. Government bail-out carries with it potentially huge costs to taxpayers. Liquidation is complex and time-consuming, and results in the bank’s customers not having access to any of their money for a lengthy period. In the case of a large bank, this could lead to serious disruption of the wider economy.

OBR works by allowing the failing bank to remain open under the control of a statutory manager. In contrast to liquidation, deposit holders have full or partial access to their accounts, while a long-term solution is worked out.

The first losses of a failing bank are borne by the bank’s shareholders and subordinated creditors, as they would under liquidation. Under OBR however, a portion of depositors’ and other unsecured creditors’ funds are frozen to meet any remaining losses, while the unfrozen part is subject to a government guarantee to give depositors confidence in the re-opened bank.

The Reserve Bank is currently working with banks to
make OBR a fully viable policy option in the Government’s financial emergency toolkit. This follows the Government confirming last year that it was considering a number of permanent options – including Open Bank Resolution – to manage any future financial market difficulties and maintain confidence in the financial system.

This pre-positioning work involves ensuring banks’ IT and other systems can implement the necessary processes, something banks are required to have completed by 30 June 2013. The OBR scheme has been designed to reduce the risk of severe disruption to customers and the wider economy from a bank failure, and to minimise the need for Government bail-outs. The policy creates time for a full analysis to be carried out and the best course of action to be determined.

Importantly, OBR strengthens the incentives for bank management to act prudently and for creditors to closely scrutinise bank management – something that will be eroded if it is assumed Government will bail-out a failing bank.

The OBR policy also aligns New Zealand with the latest best practice in this area globally, as set down by international agency the Financial Stability Board.

Under the OBR policy, all locally incorporated banks with over $1 billion dollars of retail deposits will be required to participate, and therefore pre-position their internal systems for it. All other registered banks are able to opt in if they choose to.

The OBR policy will give the Government a more palatable middle ground for dealing with the unlikely event of a bank failure, minimising the impact on the broader economy and the New Zealand taxpayer.

Open Bank Resolution impact assessment released

1 November 2012

The Reserve Bank has today released a Regulatory Impact Assessment of pre-positioning for the Open Bank Resolution (OBR) policy.

OBR is a long-standing Reserve Bank policy aimed at allowing a distressed bank to be kept open for business, while placing the cost of a bank failure primarily on the bank’s shareholders and creditors, rather than the taxpayer.

The release of the Regulatory Impact Assessment follows an earlier consultation with banks on internal system changes required for OBR pre-positioning.

The Reserve Bank is also releasing a summary of submissions (PDF 137KB) received on the pre-positioning for OBR and a document that maps the OBR policy against the principles for effective resolution of a distressed bank, as set out by international agency the Financial Stability Board.

Reserve Bank Deputy Governor Grant Spencer said: "Bank failures in New Zealand are rare and the financial system remains sound. The OBR policy will offer government a very real alternative to bailout in the event of a bank failure in New Zealand. The availability of OBR as an option is expected to reduce moral hazard, strengthening incentives for banks to operate prudently and to seek private sector solutions during a crisis," he said.

It follows the Government confirming last year that it was considering a number of permanent options, including Open Bank Resolution, to manage any future financial market difficulties and maintain confidence in the financial system.

"The Regulatory Impact Assessment estimates that the net benefits of having OBR available in the resolution toolkit are worth more than $1 billion."

Mr Spencer said the OBR policy approach being taken by the Reserve Bank is consistent with global regulatory developments in this area and cements lessons gained from around the world during the global financial crisis.

All locally incorporated banks that have retail deposits of over $1 billion will be required to pre-position their systems to meet the OBR requirements by the end of June 2013.

A Q&A on OBR, a background feature and an earlier Bulletin article entitled A Primer on Open Bank Resolution (PDF 745KB) are also available on the Reserve Bank’s website.
Financial system stronger despite global stresses
7 November 2012

New Zealand’s financial system has strengthened, despite a challenging international environment, Reserve Bank Governor Graeme Wheeler said today, when releasing the Bank’s November 2012 Financial Stability Report.

“Global economic activity is weak and this is affecting emerging markets, including China. The euro area is fragile given the structural issues facing the region and global growth could be further undermined by the possibility of substantially tighter fiscal policy in the United States,” Mr Wheeler said.

Nonetheless, financial market sentiment has improved over recent months reflecting further monetary easing in the major economies and various measures to support the financially distressed euro area members. This has helped New Zealand banks access global funding markets, but has also contributed to the strength of the New Zealand dollar.

“Households and firms have generally continued to reduce their reliance on debt. However, household debt remains at relatively high levels, with many borrowers still vulnerable, especially to any correction in house prices. Leverage in parts of the agricultural sector also remains high, leaving the sector exposed to a fall in export prices,” Mr Wheeler said.

Deputy Governor Grant Spencer said New Zealand’s banks have continued to build their liquidity and capital buffers, giving them greater ability to cope with any renewed stress in funding markets or an increase in loan losses.

“Banks are well placed to meet the increase in the minimum core funding ratio from 70 to 75 percent on 1 January next year,” Mr Spencer said.

“We are continuing to strengthen the financial system, drawing on lessons from the global financial crisis. We are implementing the main elements of the Basel III capital adequacy regime as well as continuing to develop our macro-prudential framework. Further, we are putting in place a new prudential and licensing regime for the insurance sector, working with banks to pre-position their systems for Open Bank Resolution and reviewing our statutory powers for overseeing the payment and settlements system.”

RBNZ Governor comments on bank profit data
4 December 2012

Reserve Bank Governor Graeme Wheeler today commented on bank profitability data that was released recently to the Green Party.

The Bank also released the data for the period 2009-2011, which shows returns on equity and assets of New Zealand banks appear to be in line with other advanced economies (excluding euro area countries).

Mr Wheeler said the Bank commissioned the data before the Finance and Expenditure Committee hearing into the Bank’s Financial Stability Report on 7 November. However, the analysis was not complete at the time of the hearing, at which he was asked about bank profits.

“My response to the Select Committee represented my understanding of the information available at that time. Our analysis was completed after the hearing and we released it to the Green Party in response to their request, which followed the hearing. We are now releasing it publicly.”

Mr Wheeler said different measurement practices around the world, including or excluding tax and extraordinary items, meant that international comparisons of bank profit figures are not straightforward.

“Profits in the New Zealand banking system reflect relatively low levels of non-performing loans, and low cost-to-income ratios, compared with many other countries,” Mr Wheeler said.

Mr Wheeler denied the Green Party’s statement that the Reserve Bank is biased in favour of Australian banks.

“The Reserve Bank takes seriously its mandate from Parliament to supervise the New Zealand banking system, and it does do without favour. Australasian-owned banks emerged in better shape from the global financial crisis because of their more conservative management, and our economies benefit from that strength.
“New Zealand’s strong banking system helped see the country through the global financial crisis.

“As I said at the Select Committee hearing, bank profitability has recovered to where it was prior to the global financial crisis, based on returns on assets. If you look at the return on equity, they haven’t got back to where they were prior to the global financial crisis, and that’s partly because these banks are building up capital as part of the tougher Basel III regulatory requirements.”

Reserve Bank launches Twitter channel
5 December 2012

The Reserve Bank has launched an official Twitter channel, @ReserveBankofNZ, to complement its existing public information services.

The @ReserveBankofNZ Twitter account provides an additional method of receiving Reserve Bank news in a timely and accessible manner. It will include all Reserve Bank news releases.

The Bank’s website provides more information on the Twitter service and how to become a follower of the Bank’s account.

The Reserve Bank website remains the main channel for the release of Bank information. In addition, the Reserve Bank Email Service and RSS feed are also available.

OCR unchanged at 2.5 percent
6 December 2012

The Reserve Bank today left the Official Cash Rate (OCR) unchanged at 2.5 percent.

Reserve Bank Governor Graeme Wheeler said: “Economic growth has slowed in recent months and has been accompanied by low inflation and rising unemployment. However, over the next two years, growth is expected to accelerate to between 2.5 and 3 percent per annum.

“The global outlook remains soft but appears less threatening than was the case earlier in the year. The risk of severe near-term deterioration in the euro area has decreased and Chinese economic indicators have been more positive recently. However, uncertainty around the US fiscal position is constraining US growth.

“Repairs and construction in Canterbury continue to gather pace, and the housing market is strengthening, particularly in Auckland. Lower funding costs for New Zealand banks, along with increased competition for lending, have seen mortgage interest rates reduce.

“Dampening factors include the Government’s fiscal consolidation and continued cautiousness by households and businesses in their spending decisions. The high New Zealand dollar continues to be a significant headwind, restricting export earnings and encouraging demand for imports.

“The overall outlook is for stronger domestic demand and the elimination of current excess capacity by the end of next year. This is expected to cause inflation to rise gradually towards the 2 percent target midpoint.

“Monetary policy remains focused on keeping future average inflation near the 2 percent target midpoint. The Bank is closely monitoring indicators for any sign of further moderation and is mindful of recent downside surprises to employment and inflation outturns. With the reconstruction-driven pick-up in investment now clearly underway, the Bank will also continue to watch for a greater degree of inflation pressure than is assumed.

“On balance, it remains appropriate for the OCR to be held at 2.5 percent.”

RBNZ releases final Basel III capital requirements
11 December 2012

The Reserve Bank today released the final capital adequacy standards, which apply to locally incorporated registered banks in New Zealand and implement the Basel III capital requirements.

The bulk of the new standards take effect from 1 January 2013 and set higher minimum requirements around how much regulatory capital must be held by registered banks, along with which financial instruments may be treated as regulatory capital.

A further key feature of the reforms is the introduction, from 1 January 2014, of a new counter-cyclical capital buffer that can be applied in times of excessive credit growth.
In addition to the final standards, a response to submissions (PDF 32KB) on the Reserve Bank’s earlier draft capital adequacy requirements has also been released.

The Basel III capital framework was introduced by the Basel Committee on Banking Supervision (BCBS) in December 2010 to raise the quality and level of capital in the global banking system.

Deputy Governor Grant Spencer said: “The final capital adequacy requirements released today considerably enhance the ability of the New Zealand banking system to absorb shocks, whatever their source.

“New Zealand banks are already well capitalised and this has made it easier for New Zealand to implement the Basel III package ahead of the schedule set by the BCBS,” he said.

While the key elements of the Basel III regime have been released today, two parts are still to be finalised by the Reserve Bank including counterparty credit risk and disclosure requirements. New disclosure requirements will take effect from 31 March 2013. The counter-party credit risk requirements will take effect in early 2013.

RBNZ comments on Avanti Finance sentencing
12 December 2012

The Reserve Bank has noted yesterday’s sentencing of Avanti Finance Limited in relation to a breach of the Reserve Bank of New Zealand Act 1989.

Avanti Finance had earlier pleaded guilty to a breach of section 157L of the Reserve Bank Act, and was sentenced in the Auckland District Court yesterday after failing to maintain the required number of independent directors on its board. Avanti Finance was fined $15,000.

Reserve Bank Deputy Governor Grant Spencer said it was important that non-bank deposit takers, of which Avanti Finance is one, are familiar with their directors’ outside interests.

“Sound governance is a key aspect of the non-bank deposit taking regulatory regime. The requirement to have two independent directors is pivotal in strengthening this sector and avoiding the issues experienced by some finance companies in recent years. As a result, it is important that non-bank deposit takers are aware of their directors’ interests, to ensure they meet the Reserve Bank requirements to have two independent directors on their boards,” Mr Spencer said.

New bank registered
17 December 2012

The Reserve Bank of New Zealand today announced that Heartland Building Society has been registered as a bank in New Zealand.

There are now 22 registered banks in New Zealand, which are listed on the Reserve Bank’s website.
PUBLICATIONS

Regular publications
Annual Report Published in October each year.
Monetary Policy Statement Published quarterly. A statement from the Reserve Bank on the conduct of monetary policy.

Reserve Bank of New Zealand Statement of Intent, 2012-2015

Recent Reserve Bank Discussion Papers

2012
DP2012/01 The financial accelerator and monetary policy rules Güneş Kamber and Christoph Thoenissen
DP2012/02 Modifying Gaussian term structure models when interest rates are near the zero lower bound Leo Krippner
DP 2012/03 The information content of central bank interest rate projections: evidence from New Zealand Gunda-Alexandra Detmers and Dieter Nautz
DP2012/04 Measuring the stance of monetary policy in zero lower bound environments Leo Krippner
DP2012/05 The macroeconomic effects of a stable funding requirement Chris Bloor, Rebecca Craigie and Anella Munro
DP2012/06 Matching efficiency and business cycle fluctuations Francesco Furlanetto and Nicolas Groshenny

A full list of Discussion Papers is available from Administration, Economics Department.

Analytical Notes

2012
AN 2012/01 House price expectations of households: a preliminary analysis of new survey data Graham Howard and Özer Karagedikli
AN 2012/02 Kiwi drivers - the New Zealand dollar experience Chris McDonald
AN 2012/03 Currency intervention – the profitability of some recent international experiences Enzo Cassino and Michelle Lewis
AN 2012/04 In search of greener pastures – improving the REINZ farm price index Ashley Dunstan and Chris McDonald
AN 2012/05 A model for interest rates near the zero lower bound: An overview and discussion Leo Krippner
AN 2012/06 Not a jobless recovery, just a slow one Rebecca Craigie, David Gillmore and Nicolas Groshenny
AN 2012/07 Risk, return, and beyond: A conceptual analysis of some factors influencing New Zealanders’ investment decisions Elizabeth Watson
AN 2012/08 Extending the Reserve Bank’s macroeconomic balance model of the exchange rate James Graham and Daan Steenkamp
AN 2012/09 Do actual and/or expected OCR changes affect the New Zealand dollar? Jason Wong and Bevan Cook
AN 2012/10 Modelling New Zealand mortgage interest rates Enzo Cassino
AN 2012/11 Building a picture of New Zealand manufacturing Gael Price
AN 2012/12 Market perceptions of exchange rate risk Michelle Lewis
Pamphlets
Explaining Currency
Explaining Monetary Policy
The Reserve Bank and New Zealand's Economic History
This is the Reserve Bank
Your Bank's Disclosure Statement -- what's in it for you?
Upside, downside -- a guide to risk for savers and investors, by Mary Holm
Supervision of the insurance industry: a quick reference guide

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Articles in recent issues of the
Reserve Bank of New Zealand Bulletin

Vol. 74, No. 4, December 2011
Towards understanding what and when households spent
Sudden stops, external debt and the exchange rate
Insurer solvency standards - reducing risk in a risk business

Vol. 75, No. 1, March 2012
The evolution of prudential supervision in New Zealand
Business cycle review, 1998-2011
A brief history of monetary policy objectives and independence in New Zealand
The New Zealand Debt Conversion Act 1933: a case study in coercive domestic public debt restructuring

Vol. 75, No. 2, June 2012
Monetary policy in the last business cycle: some perspectives
Bank funding - the change in composition and pricing
Anti-money laundering and countering the financing of terrorism - the Reserve Bank’s supervisory approach

Vol. 75, No. 3, September 2012
Alan Bollard – Reflections from 2002-12
The economic impact of the Canterbury earthquakes
Asset returns and the investment choices of New Zealanders
Foreign currency reserves: why we hold them influences how we fund them
Dealing with debt: speech to the Auckland Employers and Manufacturers Association
Learnings from the Global Financial Crisis: Sir Leslie Melville Lecture, Australian National University, Canberra