
Twenty years of inflation targeting

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1 Introduction

In December 2009 the Reserve Bank of New Zealand, in conjunction with Northwestern University's Centre for International Economics and Development (CIED), hosted a monetary policy conference to mark the 20th anniversary of the Reserve Bank of New Zealand Act. Passed in December 1989, the Act was one of the seminal events in the development of inflation targeting as a monetary policy regime.

Inflation targeting, with its emphasis on price stability, policy-maker independence, and communication to influence expectations, has become hugely influential internationally as a monetary policy framework. As of 2009, 26 countries have explicitly adopted inflation targeting, including Canada, the UK, Australia, Sweden and Norway.¹ Even in countries and regions that do not have an explicit inflation targeting framework, such as the euro area and the US, the ideas underpinning inflation targeting and the methods used to implement policy in an inflation targeting regime have become increasingly influential.² It is therefore fitting that the Reserve Bank and the CIED chose to celebrate this historic, 20-year milestone.

A conference on monetary policy was particularly apt for 2009 because macroeconomic developments over the last two years have created the largest stresses for the global economy, the global financial system, and policy frameworks

since the Great Depression of the 1930s. The decline in global economic activity in 2009 – now being termed 'the Great Recession' in the US – has prompted renewed scrutiny of macroeconomic stabilisation policy, financial systems, and the regulatory frameworks within which financial institutions operate.³

Policy questions are among the pre-eminent concerns that have arisen from the Great Recession. For example: Should one seek to stabilise the economy through fiscal or monetary policy? How effective is fiscal policy in times of crisis? What kind of 'unconventional' monetary policies are available, and how (and why) might they work? What kinds of credit frictions are operational, and how do they influence the propagation of shocks? How should policy be operated in the context of a small open economy? What sort of financial regulation should be implemented and what consequences does regulation have for long-run optimality? At the December conference, leading academics and staff from the Reserve Bank came together to address these and related questions.

2 Backdrop – the Great Recession

In this section we briefly describe elements of the global macroeconomic crisis that serve to motivate many of the papers presented at the Reserve Bank-CIED conference.

One of the key events widely identified as contributing to the global macroeconomic crisis was the boom and subsequent bust of the US housing market. The boom was associated with the development of new financial securities often backed by housing mortgages. These securities facilitated an increase in mortgage debt by US households, and enabled financial institutions around the world to obtain an exposure to the debt via the purchase of those securities. As the US housing market reversed, the value of the securities fell. The decline in security values resulted in direct losses to some institutions (eg, Washington Mutual), indirect losses to others with exposure to those institutions (eg, American International Group), and liquidity issues (eg,

¹ For a description of inflation targeting regimes see Scott Roger's IMF Working Paper WP/09/236, "Inflation targeting at 20: Achievements and Challenges", <http://www.imf.org/external/pubs/ft/wp/2009/wp09236.pdf>

² See for example the March 2003 speech of then-Governor Ben Bernanke "A perspective on inflation targeting", <http://www.federalreserve.gov/Boarddocs/Speeches/2003/20030325/default.htm>

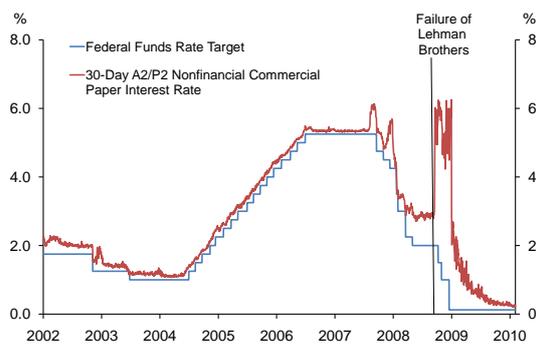
³ Catherine Rampell notes in the New York Times, 11 March 2009, that just about every US recession since 1974-5 has received the label 'the Great Recession' from some commentator or other at some point. The NBER Business Cycle Dating Committee determined that the US economy peaked in December 2007, and has since been in recession. Over 2009, annual growth in US GDP dropped by the greatest amount since 1946. Thus, the current US recession does seem to warrant the adjective 'great'.

an unwillingness to lend to Lehman Brothers) in response to a lack of transparency about the value of impaired securities, and a lack of information about who owned such assets.

Policy interventions were required to assist many financial institutions affected by the reduction in their capital base (due to lower security values) and/or liquidity problems, and to maintain confidence in the financial system as a whole. Investment banks in the US transformed themselves into generic commercial banking entities (eg, Goldman Sachs) to access liquidity through the Federal Reserve's discount window, or simply merged with stronger entities (eg, Merrill Lynch with Bank of America).

Financial and private-sector firms' ability to borrow became a key concern during the crisis. As a result, the spread between non-government and government interest rates increased substantially. (See figure 1.) Global inter-linkages also meant that banks such as Northern Rock in the UK and Hypo Group Alpe Adria in Austria, and institutions elsewhere, were subject to the same liquidity and solvency pressures, and were essentially nationalised or were shepherded into mergers with banks with stronger balance sheets.

Figure 1
US interest spread

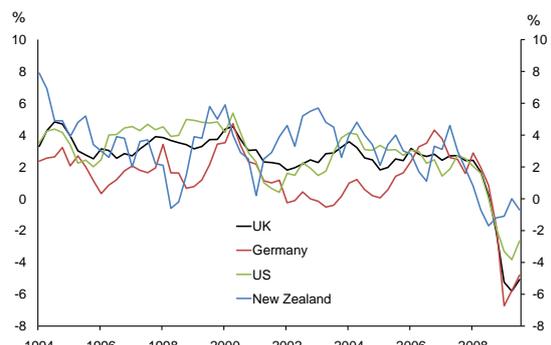


Source: US Federal Reserve.

The real economy – so-called 'Main Street' in the US – was not left unscathed by financial developments on Wall Street. Given concerns about solvency and liquidity, banks became less willing to lend to businesses and households for investment and consumption purposes, so those quantities dropped sharply. International trade dropped substantially as demand declined, and unemployment increased as businesses required less labour.

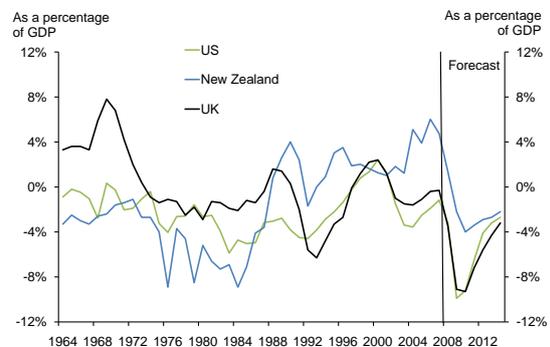
These developments were part of a broad global phenomenon. (See figure 2.) Easy monetary policy (via lower interest rates and quantitative easing) and fiscal stimulus (in the form of increased government expenditure and resultant increases in fiscal deficits and debt, see figure 3) became the global norm in an effort to offset the decline in private sector activity.

Figure 2
Annual GDP growth rates



Source: Haver, Statistics New Zealand, US Federal Reserve.

Figure 3
Government deficits



Source: New Zealand Treasury, US Congressional Budget Office, UK Treasury.

The developments described above form the macroeconomic backdrop to many of the papers presented at the conference, some of which are described below.

3 Credit frictions in the Great Recession

One of the themes in the conference was the role that credit frictions played in amplifying and propagating shocks in the housing market to the rest of the economy. The consensus view is that financial frictions and imperfections, either in

the form of credit constraints, sunspots in behaviour, or principal-agent problems involving financial intermediaries, can be powerful determinants of economic activity.

Liu *et al* investigate the extent to which credit constraints on consumers and firms amplify macroeconomic fluctuations using a dynamic stochastic general equilibrium (DSGE) framework. Traditionally, there has been little success in modelling the empirical significance of credit constraints for macroeconomic fluctuations. Liu *et al* argue that the muted effect of credit constraints stems from the absence of a mechanism connecting house price movements and business investment. The authors reason that in a world with limited contract enforcement, borrowing is limited by the need to secure contracts with collateral assets. The need to collateralise debt provides a mechanism through which fluctuations in asset prices can affect business investment, since an increase in asset prices relaxes the credit constraints faced by firms. This link between liquidity constraints and asset prices can amplify and propagate small shocks in asset markets into large and persistent business cycle fluctuations. Liu *et al* find that, in general, credit constraints do not amplify nonfinancial shocks or financial shocks that shift the supply of an asset. However, a shock that shifts the demand for collateral assets, such as land or housing, generates a two-way feedback between the asset price and business investment, which can ultimately cause large macroeconomic fluctuations. Crucially, their model explains the observed positive and persistent co-movements between US housing prices and business investment.

Harrison and Weder examine how business cycles can be driven by self-fulfilling expectations. Their model shows that speculative asset price movements, driven by increasing debt, lead to a credit crisis. Harrison and Weder find evidence that sustained pessimism may have been a leading ingredient in turning what might have been an ordinary slump into the Great Depression. They find evidence that the financial crisis of late 2008 was also driven, at least in part, by self-fulfilling pessimism and sunspot equilibria.

Hall defines financial frictions as divergences between returns received by providers of financial capital and the cost of capital paid by businesses and consumers – which he also terms a financial wedge. Hall finds that an increase in

financial frictions can be a potent driver of macroeconomic fluctuations in output and employment.

Hall argues that the spread between commercial and government debt reflects 1) expected default rates; 2) differences in financial risk (reflecting the covariance of the asset return with the risk-free return); and 3) financial frictions. In the crisis, all three are presumed to have increased, so the spread itself is an upper bound on the importance of the financial friction. In Hall's model, an increase of six percentage points in the financial wedge (see figure 1) causes reductions in output and investment comparable to those that occurred in the US following the crisis.

4 Policy responses to the Great Recession

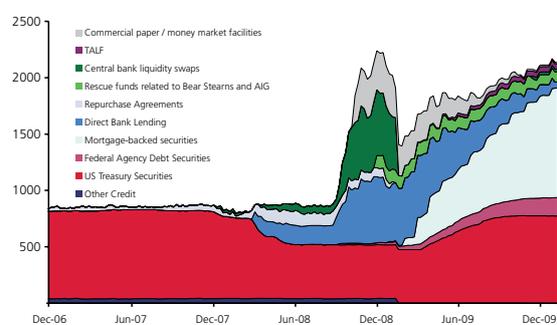
The second area of discussion at the conference concerned policy responses to the crisis, including optimal fiscal, monetary and regulatory policy. Many of the papers focused on the effects of fiscal stimulus and monetary policy when nominal interest rates are close to or at the zero lower bound.

Christiano *et al* argue that the size of the government-spending multiplier depends greatly on the nominal interest rate. In their model, the government-spending multiplier is small if the nominal interest rate is positive and governed by a Taylor rule: usually increases in government expenditure require offsetting monetary policy actions to stabilise aggregate demand and hence inflationary pressures. However, if the nominal interest rate has reached its lower bound of zero, and hence there is substantial spare capacity in the economy, then increases in government expenditure do not require offsetting monetary policy actions, and so the fiscal multiplier can be much larger, exactly when fiscal actions are most required.

Gertler and Karadi develop a quantitative DSGE model for studying 'unconventional' monetary policy in the same manner that existing DSGE models are used to study 'conventional' monetary policy. In their model, financial intermediaries face endogenously determined balance sheet constraints, which

tighten during financial crises. In contrast, the central bank is not affected by the same constraints and can readily expand its balance sheet during crisis times, increasing the supply of central bank credit. (See figure 4.) Gertler and Karadi use this model to investigate the welfare benefits from central bank intervention and find that the benefits are substantial. These benefits are significantly enhanced in the case where the zero lower bound on nominal interest rates is binding. In Gertler and Karadi's model, central bank intermediation can take the form of either direct credit interventions or equity injections. The authors argue that the key factor in choosing between these alternatives is their relative efficiency cost. For example, direct central bank intermediation may be justified in fostering mortgage-backed securities or commercial paper markets, but such intermediation may be highly inefficient in the case of commercial and industrial loans that require constant monitoring of borrowers. In the latter case, capital injections into financial institutions may be preferred, since commercial institutions have specific expertise in such monitoring.

Figure 4
Federal Reserve: Supply of reserve balances



Source: US Federal Reserve.

Chari and Kehoe presented their work on optimal regulation of the financial sector, focusing on the 'time inconsistency' problems of bailing out failing banks. *Ex ante*, governments desire a commitment to a policy that lets banks fail, to ensure that private sector agents properly account for the risks of failure. However, governments will typically want to renege on this commitment *ex post* to mitigate bad macroeconomic outcomes. In turn, private sector agents – ie, banks – will anticipate that the government will renege on its commitment, and this knowledge will adversely affect their behaviour in response to risk. Chari and Kehoe therefore suggest that the government's inability to commit

to not bailing out financial firms provides a rationale for financial regulation, to moderate the likelihood and magnitude of bank failure. In Chari and Kehoe's model, reducing the incentive to bail out banks can be achieved by imposing a cap on the quantity of assets used by each firm and a cap on the probability of bankruptcy. The latter can be implemented via a cap on the debt-to-value ratio of the firm (increased equity relative to debt reduces the probability of bankruptcy).

Alonso-Carrera and Kam investigate fairly conventional monetary policy in a tractable, small open economy DSGE model with incomplete financial markets. Unlike previous models, Alonso-Carrera and Kam's model does not exhibit the same structure as a closed-economy model (technically, it is not 'isomorphic' to similar closed economy variants). This paper is of interest because it provides a theoretical foundation for the belief that monetary policy in small open economies should respond to inflation, the output gap and the real exchange rate, compared to closed-economy models where it suffices to respond just to the domestic output gap and domestic inflation.

5 Concluding remarks

The RBNZ/CIED monetary policy conference canvassed a wide array of perspectives about recent macroeconomic and financial developments, and their implications for policies. While global interaction of financial markets has clearly facilitated risk-sharing across and between nations, it has also introduced an additional channel through which shocks can be propagated. The Reserve Bank-CIED conference did much to highlight understanding of the key shocks of the recent financial crisis, the transmission of these shocks to the real economy, and appropriate policies to mitigate their effects. The conference has also motivated further research at the Reserve Bank in areas such as the design of macro-prudential policies, financial market frictions, optimal monetary policy, and the role of housing markets in the business cycle.

6 Monetary policy conference programme

More information and the papers from the conference are available at: <http://www.rbnz.govt.nz/research/workshops/MonetaryPolicyDec09/index.html>

Thursday 17 December, 2009

“When is the government spending multiplier large”, Lawrence Christiano (Northwestern University), Martin Eichenbaum (Northwestern University), and Sergio Rebelo (Northwestern University)

“A defence of the Federal Reserve Open Market Committee (FOMC)”, Martin Ellison (University of Oxford) and Thomas Sargent (New York University)

“A model of unconventional monetary policy”, Mark Gertler (New York University) and Peter Karadi (New York University)

“Do credit constraints amplify macroeconomic fluctuations?”, Zheng Liu (Federal Reserve Bank of San Francisco), Pengfei Wang (Hong Kong University of Science and Technology), and Tao Zha (Federal Reserve Bank of Atlanta)

“On a tractable small open economy model with endogenous monetary-policy trade-offs”, Jaime Alonso-Carrera (Universidade de Vigo) and Timothy Kam (Australian National University).

“Long and short interest rate targets”, Bernardino Adao (Banco de Portugal), Isabel Correia (Banco de Portugal) and Pedro Teles (Banco de Portugal).

Friday 18 December, 2009

“Bailouts, time inconsistency and optimal regulation”, V V Chari (Federal Reserve Bank of Minneapolis) and Patrick Kehoe (Federal Reserve Bank of Minneapolis).

“The high sensitivity of economic activity to financial frictions”, Robert Hall (Stanford University).

“Sunspots and credit frictions”, Sharon Harrison (Columbia University) and Mark Weder (University of Adelaide).

“Inflation and the natural rate of unemployment in US business cycles”, Nicolas Groshenny (Reserve Bank of New Zealand).