ANALYTICAL
NOTES

An overview of the distributional effects of monetary policy

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Key findings

- Monetary policy easing and tightening can potentially affect the distribution of wealth and income through several channels. The overall effect of monetary policy on inequality is indeterminate and depends on the strength of each channel, which may reinforce or offset each other.

- International empirical evidence on the distributional effects of monetary policy is inconclusive. It is not clear that monetary policy easing, be it through reductions in policy interest rates or by central bank asset purchases, necessarily reduces or worsens wealth inequality and income inequality.

Introduction

Monetary policy formulation by the Reserve Bank of New Zealand contributes to the prosperity and well-being of New Zealanders by maintaining a stable general level of prices and supporting maximum sustainable employment.[1]

Different segments of the population may be affected by monetary policy differently. It is important for the Reserve Bank to understand the potential effects of monetary policy on different groups of people in the economy. Changes in interest rates and central bank asset purchases potentially affect those with assets and those with debt differently, and also influence the balance between asset holding and debt holding over time.[2]

The effects of monetary policy on wealth and income inequality have become topical, particularly in recent years, in light of historically low interest rates in many countries over the past decade. Some central banks have acknowledged the interest in this topic and weighed in on the discussion.[3]

In New Zealand, the official cash rate (OCR) has remained at a historically low level since the COVID-19 pandemic began in early 2020. The Reserve Bank has also used alternative monetary policy tools such as the Large Scale Asset Purchase Programme (LSAP) and the Funding for Lending Programme (FLP) to support the economy in 2020. Against this backdrop of highly stimulatory monetary conditions, this *Analytical Note* aims to develop a better understanding of the international literature on the distributional effects of monetary policy on wealth and income.

In this *Note*, we focus on *monetary policy easing* (a reduction in the policy rate *e.g.* OCR or central bank purchases of financial assets).[4] The *Note* first examines the theoretical transmission channels of monetary policy easing to the distribution of wealth and income, and then explores empirical results from the international literature. In summary, we find that international evidence is inconclusive regarding the effect of monetary policy easing on wealth inequality and income inequality. In other words, it is not clear that monetary policy easing necessarily reduces or worsens wealth inequality and income inequality.

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[1] For more information on the amendments to New Zealand's monetary policy framework in 2019, see Reserve Bank of New Zealand *Monetary Policy Framework*.

[2] See Reserve Bank of New Zealand *Monetary Policy Handbook* (2020), Reserve Bank of Australia (2016), European Central Bank (2016).

[3] Examples are European Central Bank (2021, 2019), Bank of England (2018a, 2018b, 2012), Ohlsson (2017), Deutsche Bundesbank (2016).

[4] The converse may not necessarily apply to increases in policy rates or reduction in central bank asset purchases.

How does monetary policy easing affect wealth inequality and income inequality?

Monetary policy easing affects wealth inequality and income inequality primarily through four transmission channels.

1. Savings redistribution channel

Monetary policy easing reduces interest payments on debt and lowers returns on short-term deposits. Consequently, borrowers are generally better off and savers are generally worse off. The net distributional effect depends on the degrees of asset holding and debt holding across the population.

2. Portfolio composition channel

Monetary policy easing results in a fall in interest rates, which could increase asset prices. Changes in asset prices affect different segments of the population in different ways due to variation in the composition of their asset portfolios (different weights on financial assets, real estate, pension funds or other assets).

Higher house prices may not necessarily worsen wealth inequality if home ownership is broadly distributed among the population. Conversely, higher house prices are likely to exacerbate wealth inequality if home ownership is concentrated at the top of the wealth distribution. However, an increase in wealth does not necessarily translate into an improvement in welfare, particularly if the gains are not realised.

Higher financial asset prices tend to benefit households with higher net wealth as they tend to hold most of the financial assets. The extent of the effects depends on the existing distribution and composition of assets across the population.

3. Income composition channel

Households have different sources of income, *e.g.* government transfers, labour income, and capital income.

The primary source of income varies across the population. Lower income households tend to rely more on government transfers; middle income households mainly rely on labour income (wages and salaries); higher income households rely relatively more on business and capital income.

Monetary policy easing supports labour and business income, which affect different segments of the population differently, depending on their sources of income.

4. Earnings heterogeneity channel

Monetary policy easing affects people with different incomes in different ways because the primary determinants of their income differ.

Earnings at the top of the income distribution are primarily affected by changes in hourly wages. Earnings at the bottom of the income distribution are mainly affected by changes in hours worked and the unemployment rate.

Monetary policy easing results in a lower unemployment rate than otherwise, which benefits those in the labour market through a reduction in unemployment risk.

Assessing the overall effect

When assessing the overall effect of monetary policy easing on the distributions of wealth and income, it is important to consider all transmission channels. The overall effect of monetary policy on inequality depends on the strength of each channel, which may reinforce or offset each other. Therefore, the overall effect of monetary policy easing on inequality is indeterminate.

The effect of each transmission channel on the distribution of wealth and income depends on a complex mix of various factors such as the existing distributions of wealth and income, household balance sheets and income sources.

There is substantial variation between households *e.g.* not all lower income households have the same characteristics – some are retired, some are more reliant on government transfers, and some are primarily reliant on wages. Monetary policy easing affects different households in different ways.

In aggregate, lower income households particularly benefit from monetary policy easing that supports their employment and labour income (relative to no monetary policy action), through the earnings heterogeneity and income composition channels respectively. This consequently reduces income inequality (Lenza and Slačálek, 2018). Some lower income households are also net borrowers who benefit from a reduction in borrowing costs due to monetary policy easing, through the savings redistribution channel.

On the other hand, monetary policy easing reduces interest rates and in turn, lifts asset prices which benefit holders of primarily longer-term assets through the portfolio composition channel. Some households may see lower returns on their short-term deposits but experience an increase in wealth from their long-term asset holdings such as real estate and equities, which may offset the lower returns on shorter-term assets and experience a better outcome overall. The relative strengths of these channels matter for the overall outcome, *i.e.* whether or not the portfolio composition channel effects outweigh the savings redistribution channel effects.

From another perspective, Bunn, Pugh and Yeates (2018) examine the effects of monetary policy easing on households of different ages. For example, although younger households experienced a reduction in income during the financial crisis (through the income composition channel), monetary policy easing reduced the extent to which younger households were made worse off. As younger households tend to be net borrowers, they also benefit from lower interest rates (through the savings redistribution channel). However, younger households also tend to have relatively few assets and may benefit less from increases in asset prices (through the portfolio composition channel). The overall effect is indeterminate as the effects through each channel can work in opposing directions. The converse tends to apply to older households, but the overall effect of monetary policy easing on these households is similarly indeterminate.

International evidence

Table 1 presents a summary of the existing empirical results on the distributional effects of monetary policy, categorising the papers on the basis of the economies considered and whether the focus is on wealth inequality or income inequality.

In theory, the effect of monetary policy on inequality is ambiguous as the quantitative importance of different transmission channels can result in its increase or decrease (Furceri, Loungani and Zdzienicka, 2016; Albert, Gomez-Fernandez and Ochando, 2019). Empirical studies that examine the effects of monetary policy easing on wealth inequality and income inequality generally yield mixed findings.

Differences in results may be due to differences in methodology, period studied, financial system and structures considered, existing distributions of wealth and income, or other public policies in place in the countries examined. As an illustration, Albert, Gómez-Fernández and Ochando (2019) find that unconventional monetary policy such as central bank asset purchases increases wealth inequality in the United States of America but has negligible effects in the euro area – a plausible explanation for the difference might be the dominance of the banking sector and the weaker role of the portfolio composition channel in the euro area.

Most empirical studies examine the transitory effects of monetary policy on wealth inequality and income inequality. Many studies consider monetary policy to affect only prices in the long run, and do not examine long-run effects on real outcomes such as the distribution of wealth and income.

Colciago, Samarina and de Haan (2019) provide a comprehensive summary of the theoretical frameworks and empirical evidence. Although multiple transmission channels are important in determining the overall distributional effect of monetary policy, many empirical studies focus on each transmission channel in isolation.

Although the international literature on the effects of monetary policy easing on wealth and income distributions during specific points in time is quite rich, there has been relatively limited work on the evolution of household wealth and income distributions over time. In particular, the transitions of the household through various parts of the wealth and income distributions over its life cycle have not been studied extensively and remains outside the scope of this *Note*.

Table 1: Summary of international evidence on the distributional effects of monetary policy on wealth and income

Effect on inequality	Wealth inequality	Income inequality
Increase (less equal)	France, Germany, Italy, Spain, United States, United Kingdom[5]; United States[6,7]	Japan[8]; Japan[9]; Belgium, France, Germany, United Kingdom[10]; United Kingdom[11]; United States[12, 13];76 countries[14]
Negligible	Japan[15]; 8 OECD countries[16]; Germany, France, Italy, Spain[17]; United States[18]; Euro area[19, 20]; United Kingdom[21]; Italy[22]	Italy[23]; Japan[24]; United Kingdom[25]; Euro area[26]; study of 32 advanced and emerging market countries[27]
Decrease (more equal)	Euro area[28]; Canada[29]; United States[30]	Euro area[31,32]; United States[33]; Canada, Netherlands, United States[34]; Germany, France, Italy, Spain[35]; Italy[36]

Note: The colours indicate the methodology used for analysis, elaborated in the footnotes.

[5] Reduction in interest rates and increase in asset prices, see Domanski *et al.* (2016), microsimulation
[6] 1 standard deviation (st. dev.) increase in monetary base, see Albert *et al.* (2019), structural vector autoregression (SVAR)
[7] -100 basis points (bps) monetary policy shock, see Albert and Gomez-Fernandez (2018), microsimulation
[8] -100 bps monetary policy shock, see Inui *et al.* (2017), local projections
[9] 1 st. dev. increase in central bank assets, see Saiki and Frost (2014), vector autoregression (VAR)
[10] -100 bps monetary policy shock, see O'Farrell *et al.* (2016), microsimulation
[11] -100 bps long-term government bond yields, see Mumtaz and Theophilopoulou (2017), SVAR and counterfactual analysis
[12] Introduction of quantitative easing, see Montecino and Epstein (2015), recentered influence functions (RIF) regressions
[13] 1 st. dev. increase in monetary base, see Albert *et al.* (2019), SVAR
[14] Increase in inflation, see Romer and Romer (1999), cross-sectional regressions
[15] -100 bps monetary policy shock, see Inui *et al.* (2017), local projections
[16] 10% increase in asset prices, see O'Farrell *et al.* (2016), microsimulation
[17] Decrease in term spread, see Lenza and Slačálek (2018), bayesian structural vector autoregression (BSVAR) and microsimulation
[18] -100 bps long-term Treasury yields, see Bivens (2015), counterfactual analysis
[19] Central bank asset purchases, see Adam and Tzamourani (2016), microsimulation
[20] 1 st. dev. increase in monetary base, see Albert *et al.* (2019), SVAR
[21] Bank rate cut to 0.5% and central bank asset purchases, see Bunn *et al.* (2018), large scale econometric model
[22] Liquidity injections and central bank asset purchases, see Casiraghi *et al.* (2018), large scale econometric model
[23] -100 bps monetary policy shock, see O'Farrell *et al.* (2016), microsimulation
[24] -100 bps monetary policy shock, see Inui *et al.* (2017), local projections
[25] Bank Rate cut to 0.5% and central bank asset purchases, see Bunn *et al.* (2018), large scale econometric model
[26] 1 st. dev. increase in monetary base, see Albert *et al.* (2019), SVAR
[27] -100 bps monetary policy shock, see Furceri, Loungani and Zdzienicka (2016), panel regressions
[28] -1 st. dev. monetary policy shock, see Hohberger *et al.* (2020), estimated open-economy dynamic stochastic general equilibrium (DSGE) model
[29] Inflation (1% increase in price level), see Meh *et al.* (2010), macro-model, scenario analysis
[30] Inflation (10% increase in price level), see Doepke and Schneider (2006), microsimulation
[31] -1 st. dev. monetary policy shock, see Hohberger *et al.* (2020), estimated open-economy DSGE model
[32] -100 bps monetary policy shock, see Guerello (2018), panel VAR and country VAR
[33] -100 bps long-term Treasury yields, see Bivens (2015), counterfactual analysis
[34] -100 bps monetary policy shock, see O'Farrell *et al.* (2016), microsimulation
[35] Decrease in term spread, see Lenza and Slačálek (2018), BSVAR and microsimulation
[36] Liquidity injections and central bank asset purchases, see Casiraghi *et al.* (2018), large scale econometric model

The New Zealand context

The empirical literature is yet to explore the links between monetary policy and wealth or income inequality in New Zealand. However, as we will demonstrate in this section, New Zealand has wealth and income distributions that are similar to those of other advanced economies that have been studied in the international literature on the distributional effects of monetary policy (figures 1 and 2). The monetary policy regime that has focused mainly on price stabilisation in the past three decades is also common throughout the developed world. For these reasons, it is reasonable to hypothesise that the links between monetary policy and wealth or income inequality in New Zealand may be similar to those observed in other countries that have been studied in the international literature.

In this section, we provide an overview of the characteristics of the existing distributions of wealth and income in New Zealand. In the absence of formal empirical evidence, we emphasise that we do **not** take a stance on how monetary policy actions by the Reserve Bank of New Zealand influence these distributions.
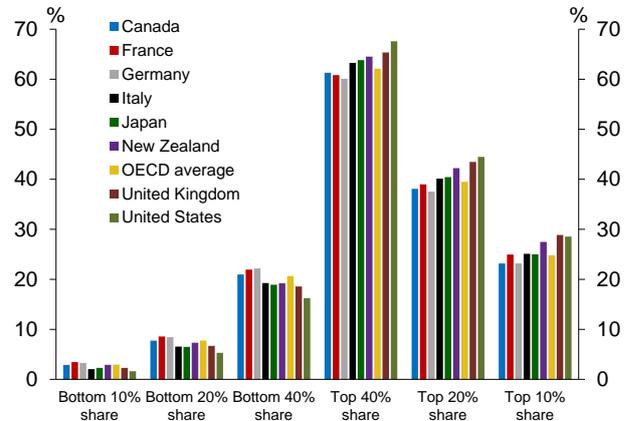
Figure 1: The distribution of household net wealth for selected OECD countries
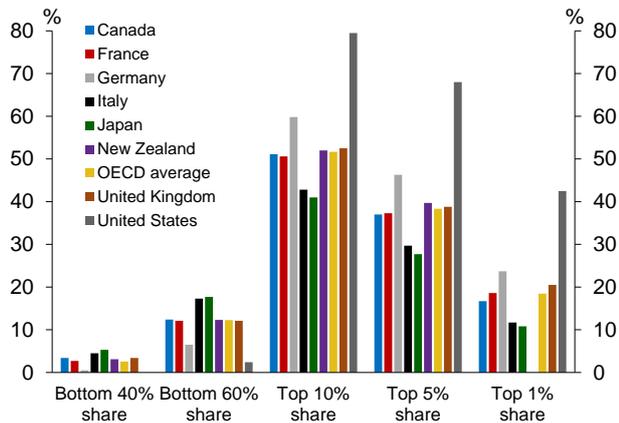
Source: OECD *Wealth Distribution Database*.

Note: On a comparable basis, data is for 2014 for New Zealand, France, Germany, Italy, and Japan; 2015 for the United Kingdom; 2016 for Canada and the United States. The OECD average was calculated with latest available data for each country. The OECD average considers only countries for which data are available. Data for New Zealand is not available for the top 1% share of household net wealth.

Figure 2: The distribution of household disposable income for selected OECD countries
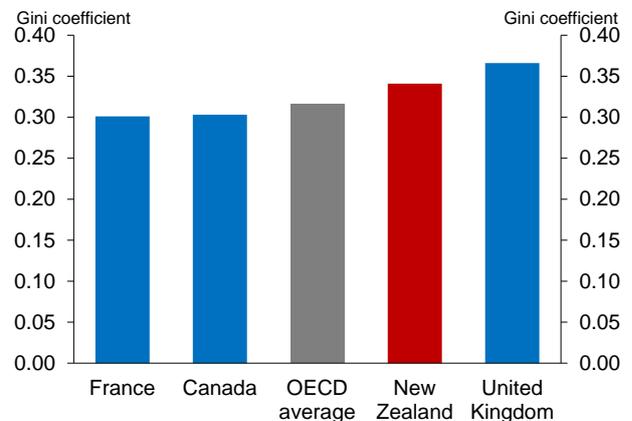

Source: OECD *Income Distribution Database*.

Note: On a comparable basis, data is for 2014 for New Zealand; 2015 for Japan; 2016 for Germany, Italy, and the United States; 2018 for Canada, France, and the United Kingdom. The OECD average was calculated with latest available data for each country. The OECD average considers only countries for which data are available.

The Gini coefficient is a common measure of income inequality. The higher the value of the Gini coefficient, the less equal the distribution of income; 0 indicates perfect equality and 1 indicates perfect inequality. The Gini coefficient for New Zealand was 0.341 in 2018, whereas the OECD average was 0.316. Although the Gini coefficient indicates that income inequality in New Zealand was greater than the OECD average, it was not too dissimilar from advanced OECD peers (figure 3).

Figure 3: Gini coefficients for disposable income, post taxes and transfers, 2018

Source: OECD *Income Distribution Database* and Perry (2019) for New Zealand.

Note: The OECD average considers only countries for which data are available.

The distribution of wealth in New Zealand

In aggregate, New Zealand households had $968 billion in non-financial assets (housing and land value) as at September 2020, $844 billion in equity and investment fund shares, and $206 billion in deposits as at December 2020.[37]

Over the past year, the value of some assets held by some households increased. For example, house prices in New Zealand increased by 24.3 percent on average in the year to March 2021. Equity prices have also seen significant increases in the past year. For example, the S&P 500 grew 54 percent in the year to March 2021 while the NZX 50 grew 26 percent over the same period. On the other hand, despite the decrease in interest on bank deposits from 1.53 percent in March 2020 to 0.71 percent in December 2020, household bank deposits increased from $189 billion in March 2020 to $205 billion in March 2021.

In 2018, the top 20 percent of wealthy households collectively held about 70 percent of total net wealth in New Zealand. Half of all households held 94 percent of New Zealand's total net wealth.[38]

The composition of household assets varied over the net wealth distribution (figure 4). Non-financial assets made up a higher proportion of assets of lower and middle net wealth households while the wealthiest twenty percent of households held mostly financial assets, although this includes property that are held in businesses and trusts (figures 4 and 5).

Figure 4: Composition of household assets for each net wealth quintile, 2018
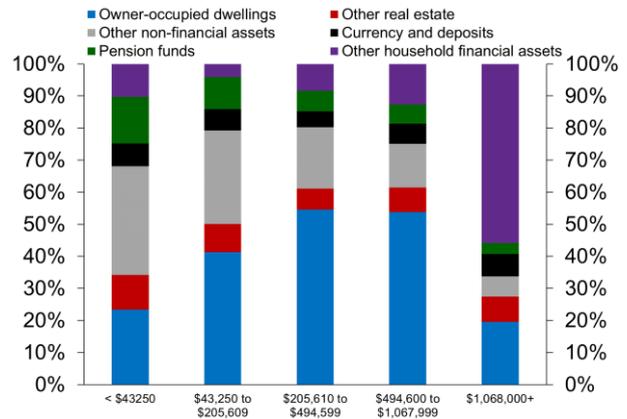
Source: Statistics New Zealand *Household Economic Survey (2018)*.

Higher financial asset prices tend to benefit households with the highest net wealth as they tend to hold most of the financial assets in New Zealand. On the other hand, ownership of non-financial assets were more broadly distributed across net wealth quintiles (figure 5).

*Figure 5: Distribution of household assets by net wealth quintiles, 2015 and 2018*
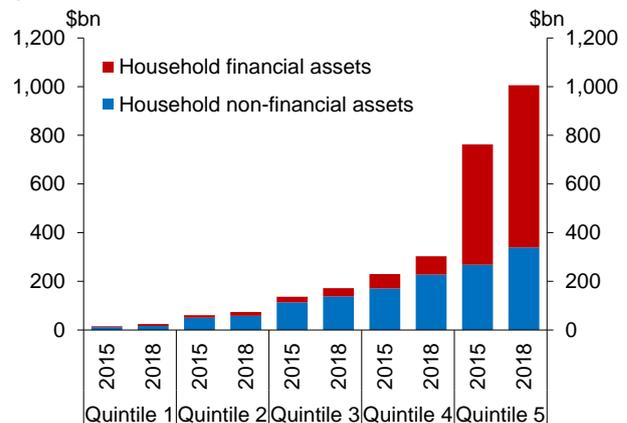
Source: Statistics New Zealand *Household Economic Survey (2015, 2018)*.

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[37] See the *Household Balance Sheet* for details.

[38] See Statistics New Zealand new release.

Wealthier households (the top 40%) saw a greater increase in their real estate asset values from 2015 to 2018 than the rest of the population (figure 6).

Figure 6: Distribution of real estate assets by net wealth quintiles, 2015 and 2018
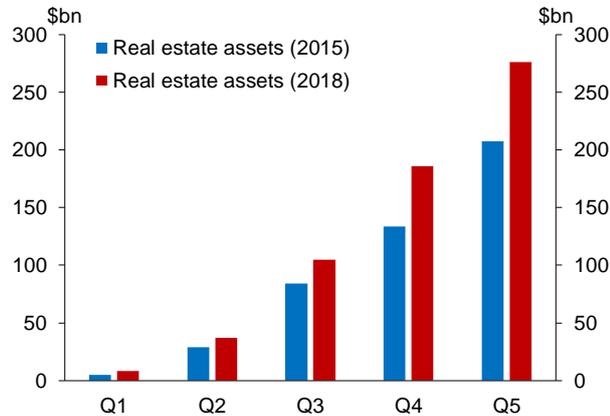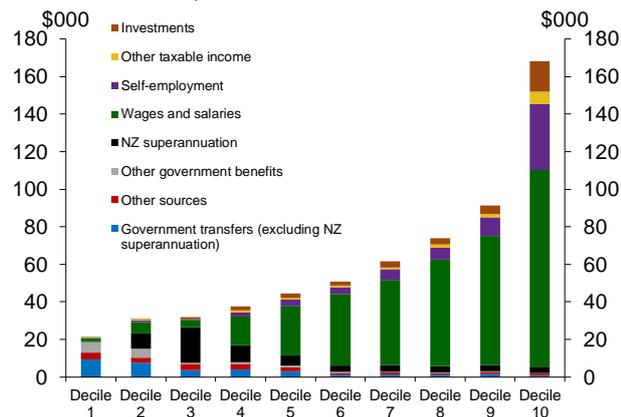

Source: Statistics New Zealand *Household Economic Survey* (2015, 2018).

The distribution of income in New Zealand

In New Zealand, lower income households tend to rely more on government transfers; middle income households primarily rely on labour income (wages and salaries); higher income households have more diversified income sources (figure 7).

Figure 7: Distribution of household incomes adjusted for size and composition of households, 2015
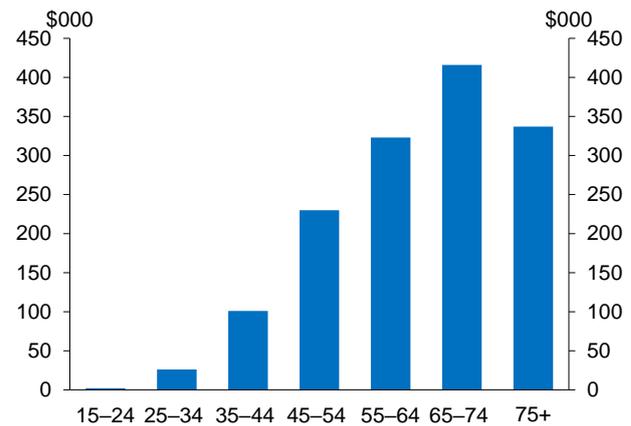

Source: Statistics New Zealand *Household Economic Survey* (2015), with subsequent Treasury calculations.

Note: Calculated using *Household Economic Survey (2015)* data with the Treasury's micro-simulation model of the tax and welfare system (all calculations should be considered as estimates).

Demographics

On average, older people are wealthier than younger people, which is consistent with a lifecycle pattern of accumulating savings over a working life for retirement (figure 8).[39]

Figure 8: Median individual net wealth by age group, 2018

Source: Statistics New Zealand *Household Economic Survey (2018)*.

In disposable income deciles 2 and 3, there were some recipients of superannuation with relatively high net wealth (figures 7 and 9). Although their disposable incomes may be lower, older people tend to be wealthier (figure 8).

Figure 9: Comparison of disposable income and net wealth by income decile, 2015
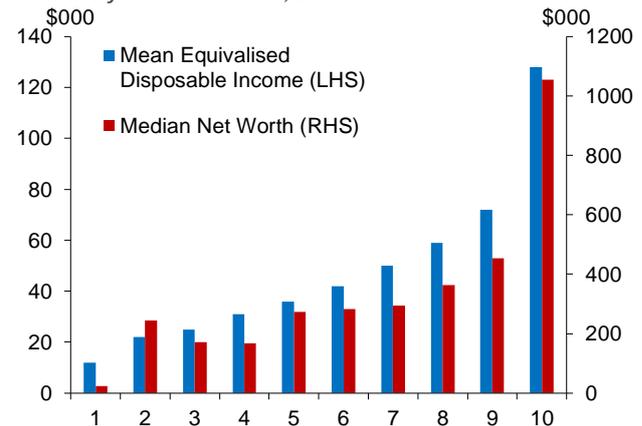
Source: Statistics New Zealand *Household Economic Survey* (2015), with subsequent Treasury calculations.

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[39] This is similar to the findings in Bunn *et al.* (2018) for the United Kingdom.

Conclusion

This *Note* provides an overview of the international literature on the link between monetary policy easing and wealth and income inequality. Monetary policy easing can potentially affect the distribution of wealth and income through multiple transmission channels. International empirical studies that examine the effects of monetary policy easing on wealth inequality and income inequality yield mixed findings. In other words, it is not clear that monetary policy easing necessarily reduces or worsens wealth inequality and income inequality. The study of the distributional effects of monetary policy in New Zealand remains an avenue for future research. This *Note* is the first in a series of analytical papers that the Reserve Bank will publish in this domain.

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