

MONETARY POLICY AND THE DISTRIBUTIONS OF INCOME AND WEALTH IN AUSTRALIA¹

Summary

The global financial crisis has sparked renewed interest in the relationship between changes in monetary policy and the distributions of income and wealth. To understand these interactions and their importance, this note examines a number of related issues for Australia:

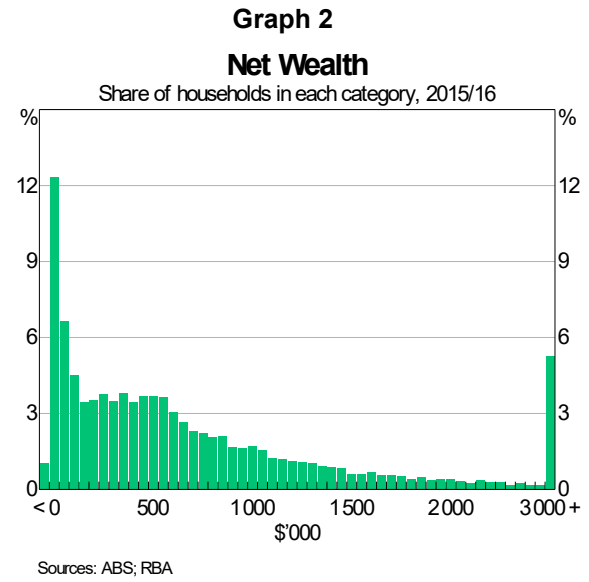
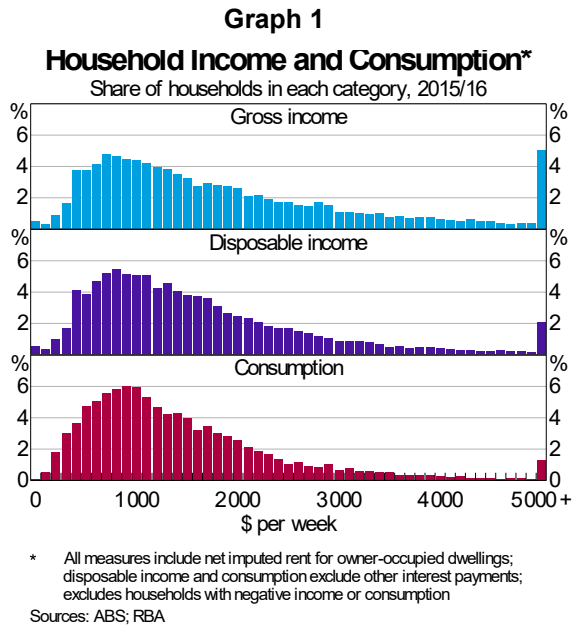
- The income and wealth of Australian households is more concentrated at the upper end of the income and wealth distributions. While this concentration has increased over recent decades, most of the change occurred prior to the global financial crisis. Australia is around the OECD average in a cross-country comparison based on summary measures of these distributions such as the Gini coefficient. Differences across countries can partly be explained by differences in tax and transfer systems.
- Australian evidence shows that some channels of monetary policy transmission depend on the distributions of income and wealth. For example, the ‘cash flow’ channel of monetary policy depends on the distribution of assets and debt across households and the sensitivity of households’ consumption decisions to changes in their income. The distribution of wealth will also influence the strength of the consumption response to asset price growth (the ‘wealth channel’).
- Changes in monetary policy can affect the distributions of income and wealth. In the short run, lower interest rates are estimated to reduce income inequality by increasing employment, which boosts incomes by more at the lower end of the income distribution. The net effect of changes in monetary policy on wealth inequality appears to be small for Australia. These results are consistent with recent findings for other economies. However, monetary policy will have more significant implications for the distributions of income and wealth if it affects the probability of recessions or financial crises, which can have longer-lasting effects on economic outcomes.
- There is persistence in the distributions of income and wealth across generations. This can be partly attributed to a tendency for educational outcomes to be correlated across generations and to inherited wealth. Other factors such as changes in the tax and transfer system, demographic change and technological change can also help to explain the large changes in income and wealth distributions since the beginning of the 20th century.

Trends in the Distributions of Income, Consumption and Wealth in Australia

Economic outcomes, such as income, consumption and wealth, are not equally distributed across households:

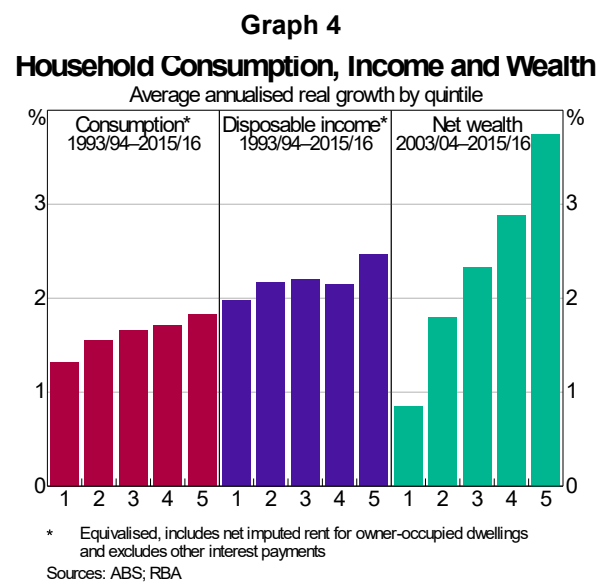
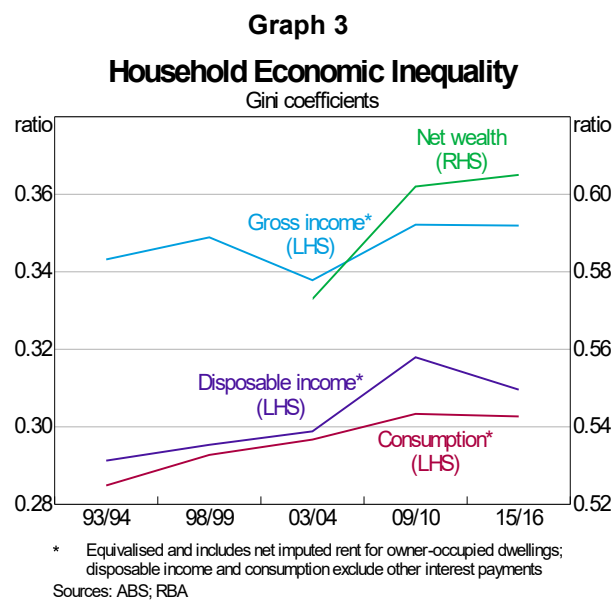
- The distribution of gross income, that is the income from working, investments and government transfers, is skewed (Graph 1).
- The distribution of disposable income, which is net of tax, is less skewed because of the equalising effect of progressive income taxes.
- Consumption is more equally distributed than disposable income because most households can smooth their consumption over time to some extent, for example, by using their savings when their income is temporarily lower (Dollman *et al* 2015). When government-provided services – such as education and health – are also considered, the distribution of consumption is more evenly distributed again.
- In contrast, net wealth (assets less debt) is less evenly distributed across households than either income or consumption (Graph 2). A large share of households have low levels of wealth, while a small share of households have very high levels of wealth.

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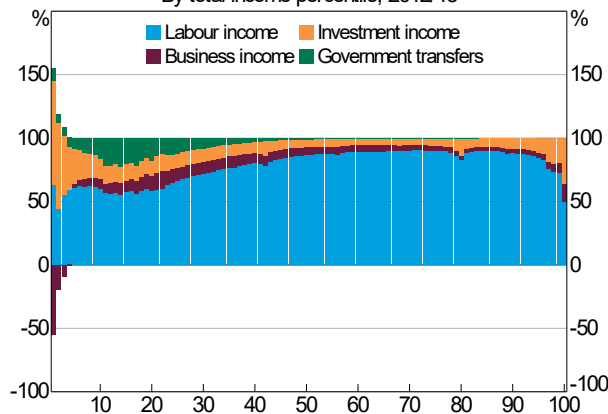
One common way to summarise the distribution of economic outcomes is the Gini coefficient, which takes the value zero when economic outcomes are equally distributed and tends to one as the distribution becomes less equal. As would be expected from the previous discussion, Gini coefficients for Australia show that the distribution of consumption is relatively equal, with a Gini coefficient of around 0.30, and that the distribution of net wealth is less equal, with a Gini coefficient of 0.61 (Graph 3).

Estimates of the Gini coefficient suggest the distributions of income and consumption became a little less equal over the 1990s and early 2000s, but have been broadly stable since the global financial crisis. The distribution of net wealth has also become less equal since the early 2000s. Inequality has increased because disposable income, consumption and wealth have grown faster for households at the upper end of the distribution, although these economic outcomes have increased in real terms across all quintiles over this period of strong economic growth (Graph 4).



Sources of income vary across the income distribution (Graph 5). Investment income is important for high income earners because they hold a disproportionate share of wealth. Investment income is also important for individuals at the lower end of the income distribution partly because retirees have relatively low incomes but a large stock of accumulated income-earning assets. Business owners recording losses are also at the lower end of the income distribution, which suggests that some of these individuals are only temporarily low-income earners. The low incomes of individuals that receive government transfers are more likely to be persistent. Labour income is important across the whole distribution.

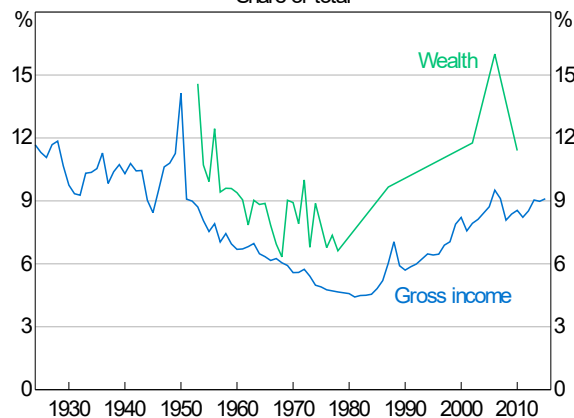
Graph 5
Composition of Personal Income
By total income percentile, 2012/13



Source: ATO

Some perspective on the size of recent trends in inequality can be gained by looking at longer-run estimates of the share of income and wealth accounted for by the top one per cent of the distribution (Graph 6). These estimates show that the top one per cent of earners in Australia accounted for around 11 per cent of total income in the 1920s. This share declined gradually between the two world wars, and then declined more steeply between the 1950s and the 1980s, when the top one per cent of earners only accounted for about five per cent of income. Since then, the share has increased gradually to around 9 per cent in 2015. A similar pattern is apparent for wealth, although the shares are much higher, as expected. The strong relationship across time between income and wealth inequality is partly related to the fact that wealth generates income. It is also related to the fact that higher income earners can accumulate more wealth.

Graph 6
Australia – Top 1%
Share of total



Sources: Chartbook of Economic Inequality; World Inequality Database

International Comparison

There are large differences in the distributions of disposable income across countries. These differences are related to the amount of redistribution that occurs through the tax and transfer system more than the initial distribution of income. In advanced economies, direct taxes and transfers reduced income inequality, on average, by about one-third in 2015 and direct transfers accounted for around three-quarters of this redistribution (IMF 2017).

The Gini coefficient for disposable income for Australia and the degree of redistribution is similar to the OECD average (Graph 7).² European countries have relatively high rates of redistribution, and therefore have a relatively equal distribution of disposable income. Similar to Australia, there is evidence that government-provided services – particularly in health and education – are important for equalising economic outcomes

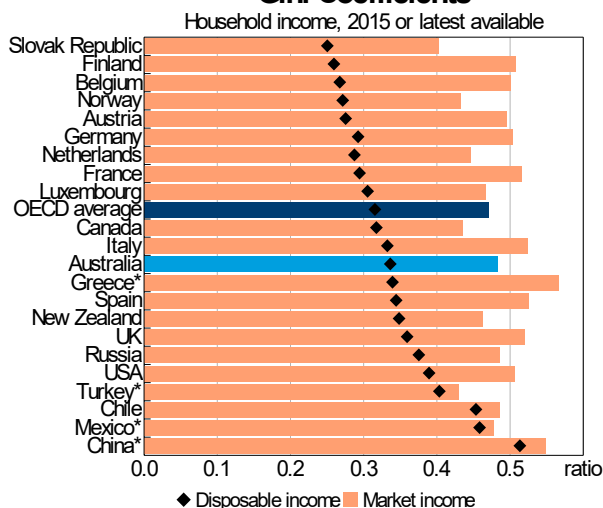
² Market income includes income that is earned from working and investments, but excludes government transfers.

in some European countries (Paulus, Sutherland and Tsakoglou 2010). In contrast, the United States stands out among advanced economies as having a relatively skewed distribution of disposable income.

Many emerging economies have relatively unequal distributions of disposable income. In some cases, such as countries in Latin America, there has been a long history of high income inequality and little redistribution. However, in Russia and China, Gini coefficients have roughly doubled from where they were in the 1980s as their economies have become more open and market driven (Scheidel 2017).

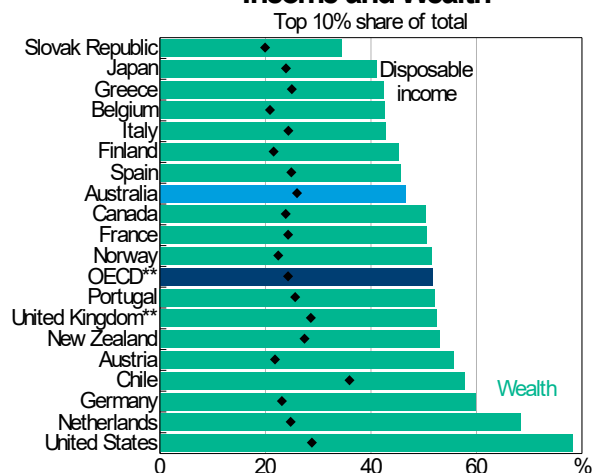
The share of wealth held by the top ten per cent of the wealth distribution in Australia is a little below the OECD average (Graph 8). The United States stands out as having a relatively high concentration of wealth at the upper end of the distribution.

Graph 7
Gini Coefficients



* Market income excludes taxes in these economies
Source: OECD

Graph 8
Income and Wealth*



* Survey year is 2015 or latest available
** Average of 27 OECD countries; wealth statistics are for Great Britain only
Source: OECD

Monetary Policy and the Distributions of Income and Wealth

The distribution of assets and liabilities across households can influence the transmission of monetary policy. In general, the effect of lower interest rates on aggregate consumption growth will be larger if the households receiving more disposable income through the cash-flow channel and/or higher asset prices through the wealth channel have more limited access to cash resources. The consumption decisions of these liquidity-constrained households are typically more sensitive to changes in income and wealth because they have less capacity to smooth their consumption over time and are more likely to spend rather than save an increase in their income.

Changes in monetary policy can also affect the distributions of income and wealth:

- The main effect is that lower interest rates increase employment, which increases income at the lower end of the income distribution thereby lowering income inequality.
- Lower interest rates can also change investment income, although the net effect on income inequality is less clear.
- Lower interest rates can affect the distribution of wealth through a number of channels, including higher asset prices and increased debt, although most estimates suggest these effects are small and largely offsetting.

The Cash Flow Channel of Monetary Policy

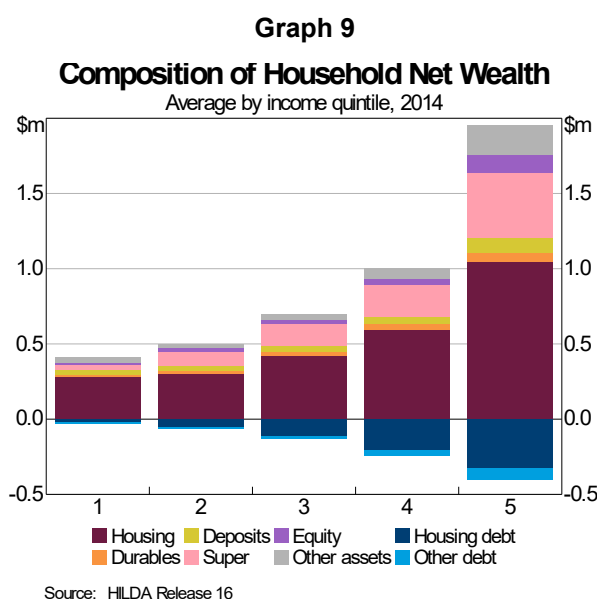
Lowering the cash rate increases the cash flow available to households that are net borrowers and decreases the cash flow for households with net interest-earning assets. Lower interest rates increase aggregate disposable income mainly because borrower households have two-to-three times more net debt that requires interest payments than saver households have in net interest-earning assets; the shares of borrower and saver households in Australia are roughly equal (Hughson *et al* 2016). The effectiveness of monetary policy through this channel is further strengthened by the fact that the consumption of borrower households tends to be at least twice as sensitive to changes in their mortgage payments as the consumption of saver

households is to changes in their interest earnings (La Cava, Hughson and Kaplan 2016). This is because borrower households tend to have less capacity to smooth their consumption over time and are more likely to spend rather than save an increase in their income.

The cash flow channel is an important part of the monetary policy transmission mechanism in Australia. Significant changes in the distribution of debt would alter the potency of monetary policy through this channel. For example, a larger share of borrower households, or an increase in the size of net debt held by borrower households would lead to a larger increase in consumption for a given reduction in interest rates, all else equal.

The Wealth Channel of Monetary Policy

Lower interest rates also increase asset prices. This can induce an increase in consumption if households treat an increase in their wealth as an indication that their lifetime resources will be higher. This is the wealth channel of monetary policy.³ The Australian data show that higher-income households have higher levels of housing and financial assets than lower-income households (Graph 9). Therefore, a given percentage increase in asset prices will lead to a higher dollar increase in wealth for higher-income households.



However, consumption by households in the top two income quintiles tends to be less sensitive to changes in wealth. This dampens the effect of higher asset prices on aggregate consumption. Simulations for a range of advanced economies suggest that economically significant changes in the net wealth distribution are unlikely to have a material effect on the strength of the wealth channel (O'Farrell, Rawdanowicz and Inaba 2016).

The Effect of Changes in Monetary Policy on the Distribution of Labour Income

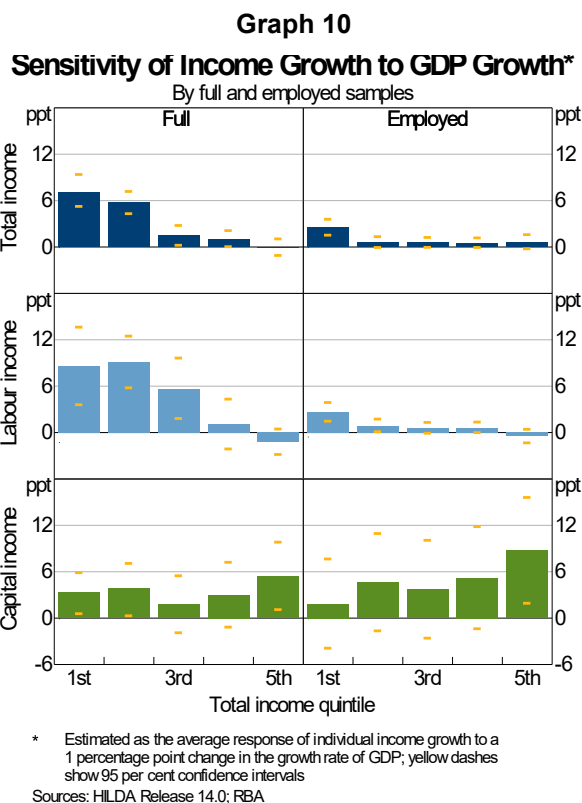
Lower interest rates can affect the distribution of labour income, the largest source of income for most individuals, through stronger aggregate demand. The effects on wages growth and employment vary across the income distribution.

The Australian evidence suggests that the labour income of people in the bottom quintile of the income distribution of employed people is more sensitive to an increase in GDP growth than the labour income of other quintiles (Stone 2016; Graph 10).⁴ Given that these people are already employed, the adjustment to labour income is either occurring through hours or wages growth.

³ For Australia, internal estimates suggest an increase of \$1 in housing wealth increases aggregate consumption by 3–4 cents, while a \$1 increase in financial wealth increases consumption by around 3 cents.

⁴ The analysis in Stone (2016) looks at the sensitivity of income growth to changes in GDP growth based on data from the Household Income and Labour Dynamics Australia (HILDA) survey. This can be translated into a discussion about the effects of monetary policy by noting that a standard, but generous, rule of thumb is that a 100 basis point cut in the cash rate would be expected to increase GDP by 1 per cent on average.

When the full sample (including those who are unemployed or out of the labour force) is considered, the labour income of the lowest three quintiles of the income distribution are all relatively sensitive to changes in GDP growth. This suggests that changes in employment status have a bigger effect on income than changes in wages or hours worked; this labour income channel is strongest at the lower end of the distribution of individual income. Total income of these groups responds by less, which suggests that insurance mechanisms such as government benefits and transfers play a role in offsetting some of the wage risk faced by lower-income earners.



The Effect of Changes in Monetary Policy on the Distribution of Investment Income

As already discussed in the context of the cash flow channel of monetary policy, lower interest rates will decrease the income of households with net interest-earning assets, such as retirees who tend to be in lower income quintiles. However, stronger aggregate demand conditions generally increase other forms of investment income, such as dividends.

There is a positive and statistically significant relationship between GDP growth and capital income for the top quintile of the income distribution, as might be expected given the importance of investment income to high-income earners. The capital income of individuals in the bottom income quintiles of the income distribution for the full sample also show some sensitivity, reflecting the relatively high representation of retirees (almost one third for the bottom two quintiles vs ten per cent for the top three quintiles). The effect of changes in capital income on the distribution of total income is relatively small because the share of capital income is relatively small across all quintiles.

Overall, the effects of monetary policy on the distribution of income are relatively small and are dominated by the employment effect on labour income. This result is consistent with the international literature (Bunn, Pugh and Yeates 2018; Ampudia *et al* 2018; Furceri, Loungani and Zdzienicka 2016).

The Effect of Changes in Monetary Policy on the Wealth Distribution

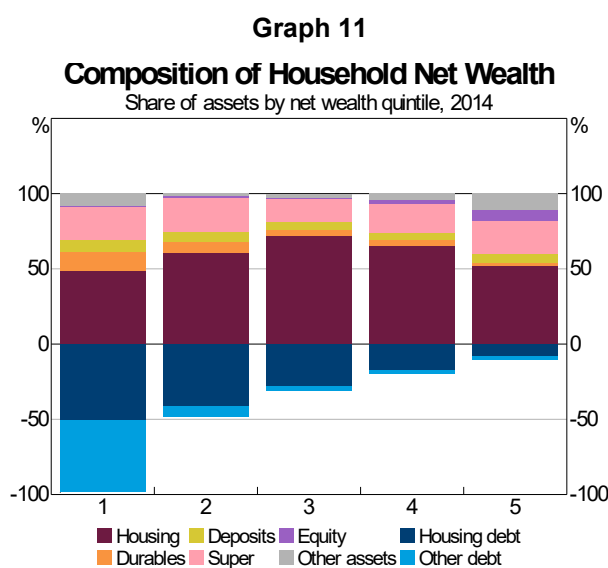
There are several channels through which lower interest rates can affect the distribution of wealth. The focus of this section, and other recent studies, is on the effect through higher asset prices.⁵ However, there are other ways lower interest rates could affect the wealth distribution that are not considered here. For

5 Day (2018) describes a scenario which looks at the response of the distribution of wealth to a 100 basis point reduction in the cash rate.

example, some households will increase how much they borrow because their ability to repay has increased or will change their asset portfolios because relative asset prices have changed. Lower interest rates will also be associated with higher inflation, all else equal, which will lead to lower debt in real terms. This latter effect is relatively unimportant in an environment of low and stable inflation compared to the effects of changing asset prices discussed here.

The effect of lower interest rates on the distribution of net wealth (assets less debt) depends on the sensitivity of different asset prices to changes in interest rates and the distribution of assets. The distribution of leverage (the ratio of debt to assets) is also important because higher leverage amplifies the effect of asset price increases on net wealth.

In Australia, housing assets are marginally more concentrated in the middle of the net wealth distribution, so a uniform increase in housing prices tends to have small effects on measures of inequality such as the Gini coefficient (Graph 11). Higher equity prices typically increase measures of wealth inequality, all else equal, because high-wealth households tend to hold a greater share of their assets in equities than low-wealth households. This is reinforced by the fact that low-wealth households tend to hold a higher share of assets with prices that are not sensitive to interest rates, such as durable goods.



However, this analysis does not take into account that a given percentage increase in asset prices will result in a bigger percentage increase in net wealth for more leveraged households. In Australia, households at the lower end of the net wealth distribution tend to have higher overall leverage than high-wealth households. The evidence for Australia suggests that this equalising effect of leverage dominates the effect of rising asset prices on measures of relative inequality. This result is consistent with recent evidence for euro area countries and the United Kingdom (Ampudia *et al* 2018; Bunn, Pugh and Yeates 2018). However, other studies find that expansionary monetary policy results in a small increase in wealth inequality (Domanski, Scatigna and Zabai 2016). This highlights that there are a number of offsetting factors and country-specific circumstances are important.

Overseas, there has been considerable debate about how unconventional monetary policies, such as large-scale asset purchases, have affected the distributions of income and wealth (see Wilkins and Cokis 2018) for details). In particular, unconventional monetary policy can have a larger effect on the distribution of wealth compared to conventional monetary policy because some unconventional monetary policy tools rely directly on increasing asset prices. Specifically, asset purchase programs increase the price of the targeted asset and other asset classes through portfolio rebalancing. Forward guidance contributes to this further by reducing the risk premia of financial assets. However, as above, the direction of the impact is unclear and depends on the particular tool used and a range of country-specific factors such as the existing distribution of assets and debt (Colciago, Samarina and de Haan 2018). Most estimates suggest the additional effect of unconventional monetary policy on the distribution of wealth has been small.

The Net Effect of Changes in Monetary Policy on the Distribution of Economic Outcomes

The dominant effect of lower interest rates is to reduce income inequality by increasing employment, but the net effect of changes in monetary policy on the distributions of income and wealth is small for Australia. This is also the general conclusion of work done recently across a number of central banks. To the extent that changes in the stance of monetary policy have symmetric effects on the distributions of income and wealth, these small effects are also likely to wash out over the course of a conventional monetary policy cycle.

However, changes in monetary policy can have larger effects on the income and wealth of some groups than others because they have different starting points in terms of earning potential and wealth. For example, stronger labour market conditions will have a more positive effect on the incomes of young people and those with fewer skills because they are more likely to be unemployed to start with. In contrast, the effect of lower interest rates on housing and financial wealth will have a bigger positive effect on older cohorts that have had time to accumulate assets.

It is also important to consider the possibility that monetary policy decisions can have more persistent effects on economic outcomes and therefore the distribution of these outcomes.

- There is a well-established literature that shows long periods of unemployment can have persistent negative effects on future labour market outcomes, such as the probability of finding a job and lifetime earnings. This may be because long periods of unemployment lead to a loss of skills or because employers use the duration of unemployment to signal employability. Whatever the cause, this hysteresis effect is more likely to be a problem for younger people and those with fewer skills and is typically associated with periods of high unemployment, such as the early 1990s recession in Australia.
- The global financial crisis has highlighted that monetary policy settings can also contribute to extended periods of asset price inflation, which have distributional consequences as discussed above. Episodes of rapid asset price inflation can be followed by significant falls that can have persistent effects. For example, evidence for the United States shows that the wealth of younger cohorts in the United States has not recovered as much from the losses incurred in 2008–09 as it has for older households (Emmons, Kent and Ricketts 2018).

Long-run Trends in the Distributions of Income and Wealth

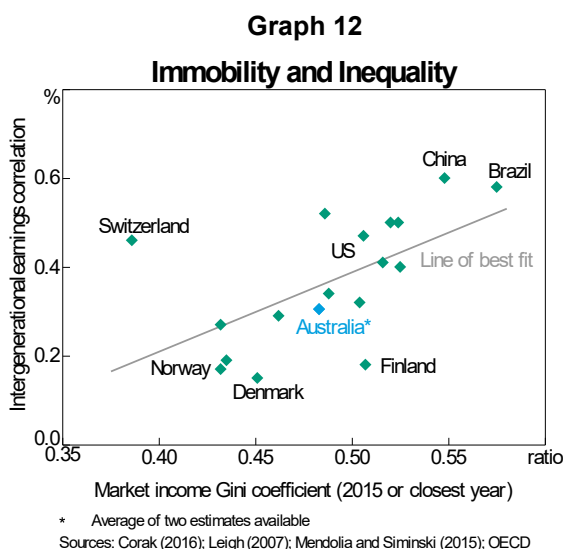
There is a considerable body of evidence showing that significant and persistent changes in the distributions of income and wealth have taken place over timeframes that span generations rather than monetary policy cycles (Piketty 2014; Bernanke 2015; Scheidel 2017). This raises the question of what does drive these longer-term trends. The persistence in the income distribution across generations is partly related to the persistence in educational outcomes. It is also related to the persistence in the wealth distribution across generations because wealth generates income. Studies of long-term trends in the distribution of wealth have emphasised the role of fiscal redistribution, demographic change and technological change.

Income

One way of measuring persistence in the income distribution is to look at the probability that households move up or down the income distribution over time. Individuals' incomes can vary noticeably over the course of their life. For example, people move in and out of the workforce to undertake education or care for children. On average, individuals spent time in five different income deciles between 2000/01 and 2015/16 (Productivity Commission 2018). However, income is more persistent at the ends of the distribution than in the middle. Around a quarter of people in the top decile and bottom two deciles in 2000/01 were the in the same decile fifteen years later. Income mobility in Australia is around average when compared with other OECD countries (OECD 2018).

Another way of looking at persistence is to measure the degree to which economic outcomes of people in the current generation are influenced by the economic outcomes of their parents. This is often done by estimating the correlation between the distribution of earnings of one generation and the next; a higher correlation suggests stronger persistence in the income distribution and less social mobility. In Australia, this correlation is around the average of the advanced economies for which we have estimates. Countries in Northern Europe tend to have relatively low correlations (high mobility) of income across generations. In

contrast, the correlation is relatively high (low mobility) in Italy, the United Kingdom and the United States, suggesting that the success of one generation in terms of income has a strong positive effect on the income prospects of the next generation. In light of this, it is unsurprising that, a higher correlation in earnings across generations (less mobility) is generally associated with a less equal distribution of income (Graph 12). This relationship has been referred to as the Great Gatsby curve.



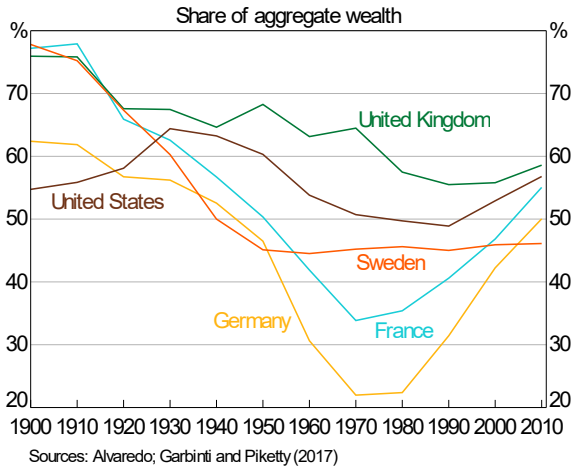
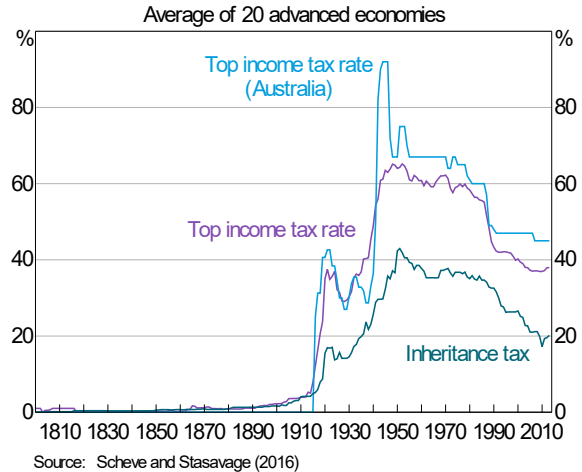
One reason for the persistence of the income distribution over time is that there is a strong correlation between the educational attainment of parents and their children.⁶ More education typically delivers a wage premium, although this varies across time and across countries. The strength of this wage premium tends to increase in periods of significant technological change because more education increases the chances of having skills that are complementary to the technological change (Dabla-Norris *et al* 2015). Corak (2013) and Autor (2014) show that countries that have higher returns to more education tend to have less intergenerational earnings mobility. Ensuring equal access to education and training opportunities would mitigate this channel of intergenerational immobility. Compared to other OECD countries, Australia currently has a relatively high degree of education mobility (OECD 2018).

Wealth

Another reason for the correlation in earnings across generations is that wealth generates income and the distribution of wealth is persistent across generations. This effect is compounded by the fact that higher earnings allow more wealth to be accumulated. An obvious driver of the persistence in the wealth distribution is that wealth can be inherited.

The share of wealth that has been inherited can be quite significant and has varied over time (Graph 13). In a number of advanced economies the share of inherited wealth fell from the First World War until the 1970s or 1980s before increasing (Alvaredo, Garbinti and Piketty 2017). Rough estimates based on a similar methodology suggest that for Australia the share of wealth that has been inherited is more likely to be in the range of 20 to 30 per cent, but it is difficult to be confident of these estimates given the relatively short time series of data available on inheritances from the HILDA survey. One explanation for why inherited wealth might be less important in Australia is that these other economies are 'older' and households have been accumulating wealth for much longer. The low share of inherited wealth in Australia is also consistent with the observation that past wealth will be less important for economies that are growing faster, either because they have faster population growth or higher productivity growth. In these circumstances, more of the stock of wealth has been accumulated in the current generation than in previous generations (Piketty 2014).

⁶ Recent work by Ohlsson, Roine and Waldenström (2014) show that 'inherited' human capital factors account for about one quarter of the persistence in the wealth distribution across four generations of Malmö residents. Most other studies are limited to comparing educational attainment of parents and their offspring.

Graph 13**Inheritance****Graph 14****Tax Rates**

There are a number of explanations for the large and persistent swings in the share of inherited wealth since the First World War in advanced economies. Some of the fall in the share of wealth in Europe is related to the destruction of capital in war and the loss of colonial assets. Changes to the taxation system have also been important (Atkinson 2015; Graph 14). Income and wealth taxes were widely introduced (and increased) between the First and Second World Wars to pay for the wars and to respond to political pressure to make sure all members of society contributed to the war efforts (Scheve and Stasavage 2016). From around the 1970s, top tax rates and inheritance taxes were reduced or abolished. This coincides with when the share of inherited wealth started to increase again.

Conclusion

There has been renewed interest in the distribution of income and wealth in recent years. Since the global financial crisis, income inequality in Australia has been relatively stable, while wealth inequality appears to have increased. Summary measures of the distributions of income and wealth for Australia are generally around the OECD average.

Central banks have focused on the relationship between the stance of monetary policy and the distributions of income and wealth. In one direction, the distribution of assets and liabilities across households can influence the effectiveness of monetary policy through the cash flow and wealth channels. In the other direction, changes in monetary policy can affect the distributions of income and wealth. In particular, lower interest rates lead to more employment in the short run, which tends to lower income inequality. However, our assessment is that changes in monetary policy do not have significant lasting effects on these distributions, with the possible exception that monetary policy can affect the probability of recessions and financial crises, which can have persistent effects.

There is a strong relationship between the distributions of income and wealth, and these distributions are persistent across generations. This suggests that the success of one generation bestows benefits on the next. Some of this persistence is related to the tendency for more educated parents to have more educated children and the fact that wealth can be inherited. As such, the most relevant policy levers to address any issues in the distribution of economic outcomes in the longer run are education policy and fiscal redistribution.

Iris Day / Economic Analysis / 9 November 2018

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