Toby Moore

Income Volatility in New Zealand

‘Economic risk is a lot like a hurricane. Hurricanes strike powerfully and suddenly. They rip apart what they touch; property, landscape and lives … And although they can be prepared for, they cannot be prevented.’ These sentiments, from Yale political scientist Jacob Hacker, explain why economic risk is a concern for households, and why the extent of that concern depends a great deal on how well households are protected against risk. The potential for individual bad luck to lead to hardship has meant that society has, in many instances, determined that individual risk should be borne collectively through systems of social welfare or social insurance (Hacker, 2008, p.5).

It is useful to remind ourselves of this fact, because much public discussion of economic security has a distinctly static quality to it. Inequality, poverty and hardship are often debated as if the involved parties were frozen in position, like figures on a complex and occasionally cruel carousel. This tendency towards treating social classes as relatively fixed means that social welfare can come to be seen as based more in charity than in reciprocal obligations and risk sharing. Though the redistributive role of government is important, there is a risk that, in Nicholas Barr’s analogy, the ‘Robin Hood’ aspect of the welfare state is emphasised at the expense of its role as the collective ‘Piggy Bank’ (Barr, 2001).

The state’s role in contributing to the smooth life trajectories of its citizens is not limited to welfare payments. The state also shapes the institutional setting in which individuals and households operate. It therefore has some hand in shaping individual incentives and levels of human capital, their exposure to shocks of various sorts and their ability to absorb or adapt to such shocks. The question of economic security for New Zealanders is therefore not simply one of social assistance, but of whether the system overall results in buffers of a public and private nature that are adequate for the challenges of the current environment.

This article examines this question through an analysis of the volatility of individual incomes in New Zealand. It begins by explaining the concept of income volatility and its importance as an indicator of economic security. The data, methodology and findings of this analysis will then be explained, followed by a consideration of the limitations of this approach in terms of both measurement and the conclusions that can be drawn. The discussion section will address how this analysis relates to existing work on income mobility, examine other evidence that might contextualise the findings and suggest areas for future research.

Measuring volatility in incomes

Income volatility is the variance in personal incomes over time. The international literature on income volatility is substantial and growing, and mostly focused on year-to-year volatility, though there is a smaller body of work

Toby Moore is a teaching fellow at the School of Government, Victoria University of Wellington.

considering volatility over a shorter time frame. As part of the 2017 'state of the state' report, *Fit for the Future: boosting resilience in the face of uncertainty*, Deloitte and Victoria University of Wellington constructed an index of income volatility for New Zealanders between 2001 and 2014. This is the first study to construct a year-by-year index for New Zealand, though other studies have addressed the question indirectly (e.g., Carter, Mok and Le, 2014).

Measuring income volatility can provide some insight into both the frequency and the impact of the shocks faced by individuals, as well as the effectiveness of government transfers in offsetting economic loss. Disruption to income can be of a direct nature: for instance, a worker being made redundant; or more indirect, such as a serious health problem that prevents someone from working. Taking a broad view of the likelihood of individual income loss does not tell us what the cause of that loss is. Nonetheless, it is useful to look at the level and trend of income volatility, if only because macroeconomic trends may not tell us the full story of what is happening at the micro level, and averages can often disguise changes in distribution.

When assessing the social and economic context in which households operate, there is a tendency to resort to broad narrative accounts such as 'globalisation', 'the great moderation' or 'the great recession'. (More recent examples would include 'secular stagnation', 'the rise of the robots' and 'the new normal'.) However, it is not immediately clear that such terms accurately reflect the experiences at the household level (Dynan, Elmendorf and Sichel, 2012). 'The great moderation' was the term used to describe the reduced volatility of key macroeconomic indicators in the United States in the decades prior to the global financial crisis (Stock and Watson, 2002); yet this was also a period of increasing volatility of household incomes, according a number of US studies (Hacker and Jacobs, 2008; Gottschalk and Moffitt, 2009).

Much has been written about why low incomes are a problem for the families that must live off them. If volatility also results in low or inadequate incomes, then the social, psychological and health- or education-related consequences associated with poverty will be of relevance (Boston and Chapple, 2014). However, downward shifts in income are important for additional reasons, beyond the possibility of falling into poverty. Greater variability in incomes makes it much harder for households to plan for the future; to be able to make major investment, educational or lifestyle decisions with reasonable confidence that they will still be in a position to manage these in the years to come. An income loss may be unanticipated, and one that households are ill-prepared for. This may force them to cut back on consumption, deplete what savings they have or resort to borrowing.

Furthermore, when households are faced with falls in their income, changes within the basket of goods and services consumed by households become very important. Though we are living through a period of low inflation, there has been a noticeable divergence in the relative costs of necessities and luxuries. Education, health, rental accommodation and homeownership costs[1] have all increased at a faster rate than the Consumers Price Index (CPI) overall since 2006 (Deloitte and Victoria University of Wellington, 2017). At the same time, the CPI has been held down by the falling price of imported manufactured goods, such as computing and cell phone technology. When incomes are rising faster than prices, this may not be a great concern. However, it does affect the balance of discretionary and non-discretionary spending in the household budget, and therefore whether households need to respond to a shortfall in income by cutting back on something more fundamental than fine foods or holidays.

Finally, income volatility measures provide us with an indirect look at the extent to which the welfare system is redistributing across the life cycle. As noted by Hills (2015), the variance of living standards at different stages of people's lives was a core rationale for the creation of the welfare state. In 1899 Seebohm Rowntree identified the 'five alternating periods of want and comparative plenty', based around the presence of children in the household and the individual commencing, and retirement from, their working life. In the model proposed by William Beveridge in 1942, the effective transfer of resources over time could help to smooth out the periods of want by providing child allowances to those with additional mouths to feed and pensions to those in retirement. The same logic applied to misfortune which might intermittently threaten the livelihood of individuals and their families, principally periods of unemployment and ill health that impair one's ability to work.

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In practice, there are areas where private insurance deals with risk relatively effectively, particularly regarding the protection of assets (e.g. home, car and contents). On the other hand, dealing with risk associated with future earnings seems to pose additional problems for markets. These problems include moral hazard, imperfect information and adverse selection. The fact that a private consumer is in fact generally not well informed about how long they will live, or their future chances of unemployment, means that risk in these areas has tended to be managed through direct state involvement, or at the very least a

Table 1: Absolute and proportional income impact of a two-income decile fall (2014 data)

Decile	midpoint	two-decile loss	percentage loss
1	[under $6,940]		
2	$10,210		
3	$14,805		
4	$18,245	$8,035	44%
5	$23,395	$8,590	37%
6	$31,655	$13,410	42%
7	$42,050	$18,655	44%
8	$53,595	$21,940	41%
9	$70,160	$28,110	40%
10	[over $80,350]		

considerable state role in regulating private markets (Barr, 2001).

Measuring income volatility can give us a better idea of how the risk-sharing function of the welfare system is operating, in terms of providing assistance in times of need. But perhaps more importantly, it provides a measure of the extent to which economic loss is an inevitability for some part of the population at any given time. Social assistance, on this account, should be understood not so much as redistribution between static groups in society, but rather as redistribution across people's own lives, from good times to bad (Hills, 2015, p.52).

Data and methodology

To get an idea of the degree of volatility of New Zealanders' incomes, we looked at the share of the working-age population who fell two or more income deciles from one year to the next between 2000 and 2014, based on Statistics New Zealand's linked employer–employee data (LEED). By way of example, this would be someone in the top 10% of income earners one year whose income fell to somewhere in the bottom 80% in the second year, or someone in the fifth decile (between the 40% and 50% points of the income distribution) who fell into the bottom three deciles (the lowest 30%). This analysis is at the individual, rather than household, level.

Table 1 shows how big an income loss a two-decile drop equates to. Taking the midpoints of each income decile,[2] a two-decile drop represents a loss of around 40% of an individual's income. Though this proportion varies somewhat, such a loss represents a substantial hit to household incomes. For obvious reasons, for those towards the lower end of the income distribution such a loss would have much greater repercussions in terms of meeting basic human needs. It should also be emphasised that this level of income loss is the minimum of what we are measuring. Some individuals will have fallen further than two deciles, and thus experienced an even more severe loss of income.

The reason for confining the analysis to drops of at least two deciles is to remove some of the 'noise' that we might see by including those who have dropped one decile. This group might include people who were just above the bottom limit for an income threshold in one year, and have fallen into a lower bracket in the following year due to a small drop in income, or by being overtaken by increases in the bottom limit for their previous bracket. This has the effect of dampening the degree of measured volatility, but we would otherwise have no easy way of determining whether what we are measuring actually corresponds with a meaningful shock to individual incomes.

This approach also means that we do not capture downward shifts in income for people in deciles 1 and 2, who do not have two deciles below them. For the sake of clarity, the exclusion of these deciles relates to the first year of the income transition measurement, meaning those falling *from* a decile to a lower one. The analysis does include individuals who fell *into* deciles 1 and 2 in the second year of the measurement (assuming that fall was of two deciles or more).

Confining our analysis to New Zealanders between the ages of 20 and 64 means that the picture is not complicated by people whose incomes fall due to retirement at age 65 or over, when they are entitled to New Zealand Superannuation. Individuals who were classified as 'absent' in the data set (i.e., not recording any income at all) for either the current year, or previous year, for any of the year-to-year movements are not counted in this analysis. This therefore excludes people who have died, or left the country between one year and the next.

LEED includes data on New Zealanders' income from wages, self-employment and most government transfers, including income-tested benefits, student allowances, paid parental leave, New Zealand Superannuation and ACC. It does not include income from investments, government transfers that are not taxable (such as childcare payments, the accommodation supplement and disability allowances) or tax transfer payments by Inland Revenue or Work and Income New Zealand. This latter category includes the Working for Families tax credits, which are payments structured around the entitlement of families rather than individuals. As the data is based on tax information, we cannot account for undeclared income.

The coverage of LEED beyond just market income means we are capturing not only the initial hit to an individual's income, but also the effectiveness of the social welfare system in offsetting that loss. It is, however, notable that as LEED includes ACC payments, and the percentages of income that equate to a two-decile drop in Table 1 are all well over 20%, ACC's model of compensating for up to 80% of pre-injury income (up to a capped sum) should exclude all but the top decile from the share of New Zealanders suffering a two-decile fall.

This picture may change slightly if we were able to account for all social transfers, including those detailed above not included in LEED. However, it is important to understand that some transfers are not designed as automatic stabilisers. Their effectiveness as a buffer against income loss is therefore questionable. For instance, a number of payments under the Working for Families tax credits have a paid work requirement of 20 hours per week for a single parent,

or a combined 30 hours per week for couples. This means that falling below the required working hours would also effect a household's entitlement to this assistance. In some circumstances the loss of entitlement to a work-related tax credit would be offset (partially or wholly) by an increased entitlement to the means-tested family tax credit. However, there may be situations in which a small decrease in the hours worked within a family leads to a change in Working for Families entitlement that actually amplifies the loss of household income, due to the steep 'cliff' associated with the strict work requirements of the in-work tax credit and minimum family tax credit.

Figure 1: Proportion suffering a fall of two income deciles or more, individuals aged 20–64 years in deciles 3–10

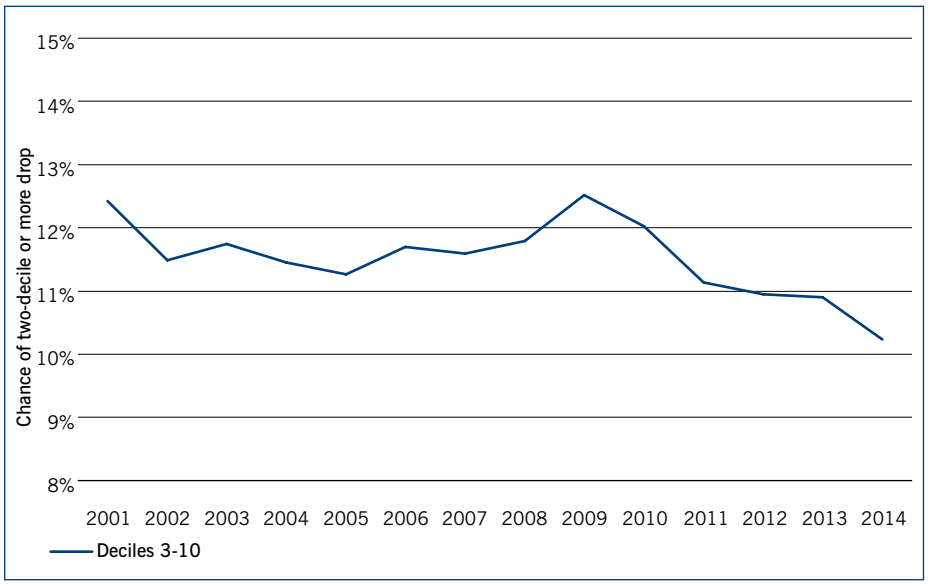
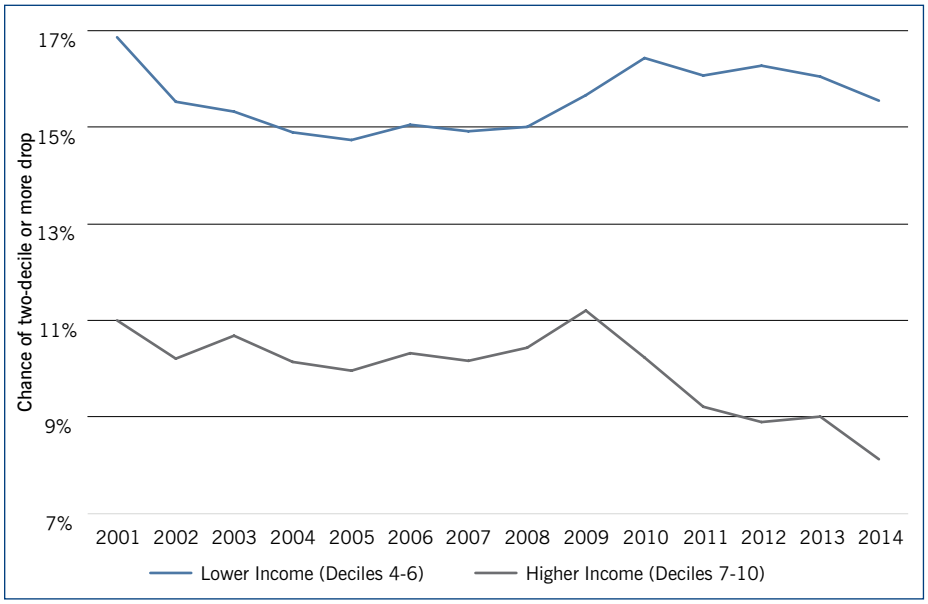


Figure 2: Comparison of levels of income volatility – lower income vs higher income individuals, aged 20–64 years



Findings

Figure 1 shows that close to one in nine working-age New Zealanders will suffer a significant fall in income in any given year. The volatility of incomes follows the business cycle, peaking in 2009 at approximately 12.5% and declining steadily thereafter. Despite this broad replication of overall economic conditions, it is notable that volatility was rising from 2005 onwards, prior to the onset of the global financial crisis.

There has not been a trend of increased volatility over the period measured. The volatility of the most recent years measured is in fact lower than that of any year during the decade beginning in 2001. In terms of total numbers of individuals, the average number of New Zealanders seeing this degree of income loss between 2001 and 2014 is over 214,000 each year.

We are also able to examine where this aggregate level of volatility is concentrated in the income distribution. As Figure 2 shows, deciles 4–6, or those receiving between $15,720 and $35,550 in 2014, have a notably higher level of volatility than the higher income deciles.[3] For this group, the year-on-year risk of a substantial income drop is generally between 15% and 17%, or somewhere between a one-in-six and one-in-seven chance.

The volatility of incomes in this lower income group has also been slower to subside in the wake of the global financial crisis than that of the measured population as a whole. Figure 3 shows the difference in risk between the higher and lower income groups set out in Figure 2, and displays a clear trend towards an increasing gap between the two. The additional risk experienced by lower income groups has increased from somewhere below 5% from 2003 to 2009, to above 7% in the more recent years measured. This is due primarily to a falling level of risk among higher income groups, rather than risk at the lower end of the income distribution increasing in absolute terms.

Income volatility by gender and age

The international literature tends to find that females have higher volatility of incomes than males (Dynan, Elmendorf and Sichel, 2012). The New Zealand data, seen in Figure 4, shows the same pattern. The volatility of female incomes is typically around one percentage point higher. Male incomes also seem to be more sensitive to the business cycle than female incomes. The volatility of male incomes rose more quickly with the onset of the global financial crisis (and is higher than for female incomes in 2010), and also subsided more quickly as economic conditions improved.

This picture changes considerably when we look at the volatility of males and females in different income groups (Figure 5). Dividing our eight-decile population into a lower income group (deciles 3–6)

Figure 3: Difference in levels of volatility faced by higher and lower income groups in Figure 2

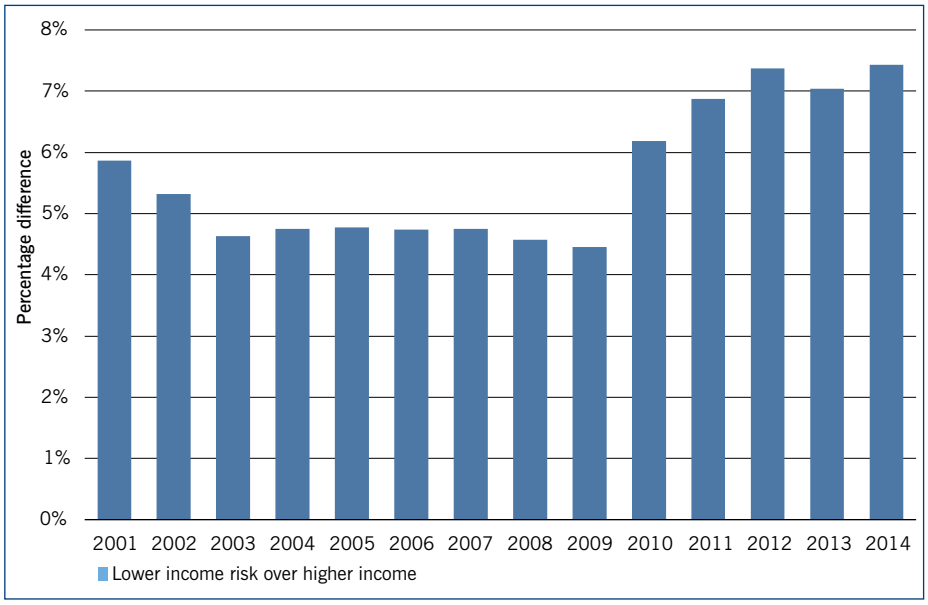
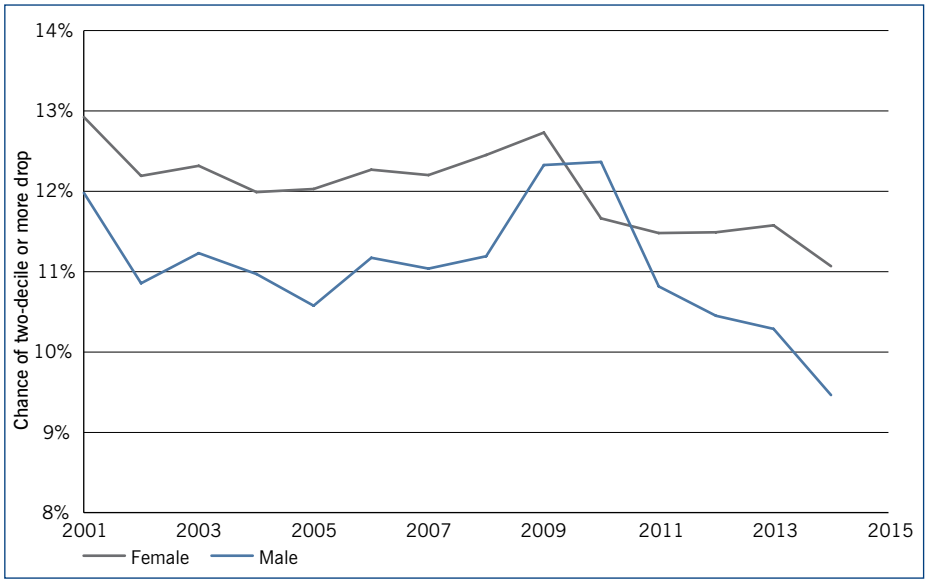


Figure 4: Comparison of male and female volatility, deciles 3–10, aged 20–64 years



and a higher income group (deciles 7–10), we see that there is a significant divergence within the male population. While female income volatility is relatively similar between the higher and lower income groups (and both are higher than for the general population in Figure 1), the lower than average volatility of males overall obscures the fact that low-income males have very high volatility of income relatively speaking. It is the very stable incomes of high-income males that drags the aggregate level below that of females.

Figure 6 shows the distribution of volatility by age. Over the period between 2001 and 2014 financial risk was experienced in an uneven U-shape between young and old. The overall distribution shows much greater volatility of income for younger age groups. The rate does rise from age 50 onwards, as would be expected due to people choosing to retire, though redundancies and health-related withdrawals from work can pose difficult challenges for people at this stage of their lives also. The volatility of incomes for those aged 65 and over is included here for comparison, and is considerably lower than that for any other age group.

Limitations

There are a number of limitations to this approach, which can be roughly grouped under two headings: those that likely overstate the degree of individual income volatility or its actual impact on households, and those that likely understate it.

Factors overstating volatility (or its impact)

Dealing first of all with the former, there are some key qualifiers to treating this measure of income volatility as a direct proxy for economic risk or insecurity. The most obvious is that we cannot easily distinguish involuntary falls in income from voluntary ones. To give one example, consider a highly paid management consultant who decides to leave that position to instead teach a meditation class. This person would receive a much lower income (though would presumably be enriched in some other, non-monetary ways). In this analysis, such a person would be counted as suffering an income loss in the same way as someone who is made redundant and is unable to find work, yet naturally the concern we would show for the former situation is nothing like that we would show for the latter. The spiritually-enriched former consultant does not lack for substantial freedoms, following Sen's capabilities approach, in the same way as the out-of-work individual (Sen, 1999).

The more common instances of voluntary income loss are likely to be those relating to work/life balance and changing careers. This includes those who reduce their involvement in paid work to undertake study or training, or to care for children, elderly parents or relatives with disabilities. However, all such decisions are made in circumstances that are beyond our own control to some degree, and there are clearly instances where such situations should not be understood as being fully voluntary. This includes someone choosing to retrain because they anticipate fewer job opportunities in their current industry, or those who have people close to them in need of their ongoing assistance.

Nonetheless, it is important to note that an income loss which is regarded as voluntary might still be a matter of social concern. Retraining and parental leave are inevitable occurrences in society, and it is a matter of societal priorities as to whether more should be done to counterbalance the income loss that typically accompanies these situations.

There are further factors to take into account that might overstate the impact of income volatility. As our data is individual, it does not take into account the picture at the household level, which is more important when it comes to the well-being of those who are part of a resource-sharing economic unit. Specifically, if a loss of income suffered by one individual leads to another income earner within the household increasing their work hours, then any impact on household consumption is likely to be offset to some degree.

Unlike many international studies, this data is longitudinal only in a short-term sense. We are observing in essence a large number of two-year snapshots over the 14 years of available data, and so cannot assess whether a fall in income from year one to year two is followed by a bounce back of some sort in year three.

Furthermore, before making any judgements on whether an observed income loss leads to a decrease in household consumption, we ought to consider what options are available to households to 'smooth' deviations in income. For instance, households could (in some combination) resort to savings or draw upon other assets, borrow to cover a shortfall, or they may have access to insurance. This is discussed in greater detail below.

Figure 5: Comparisons of male and female volaility by income groups, deciles 3–6 and 7–10, aged 20–64 years

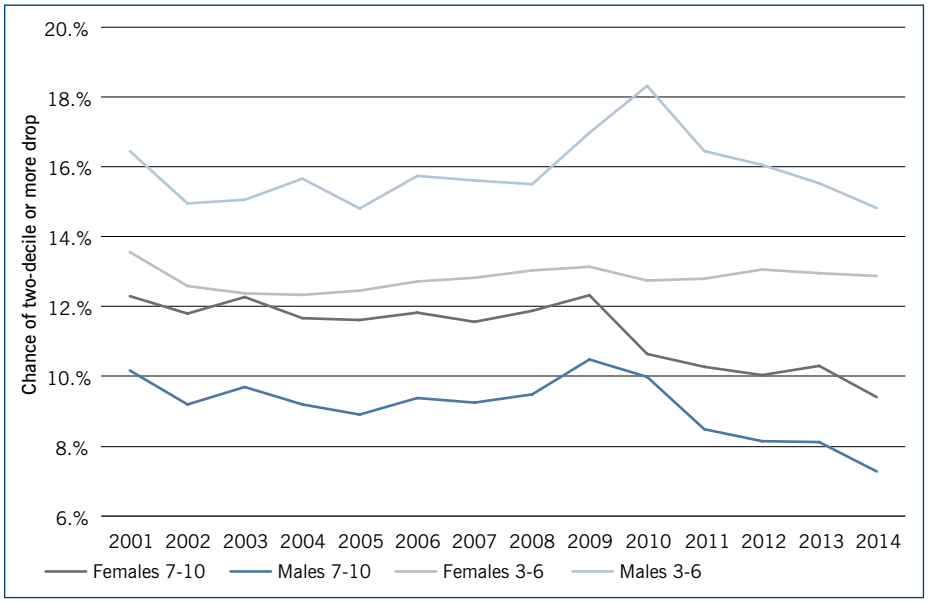
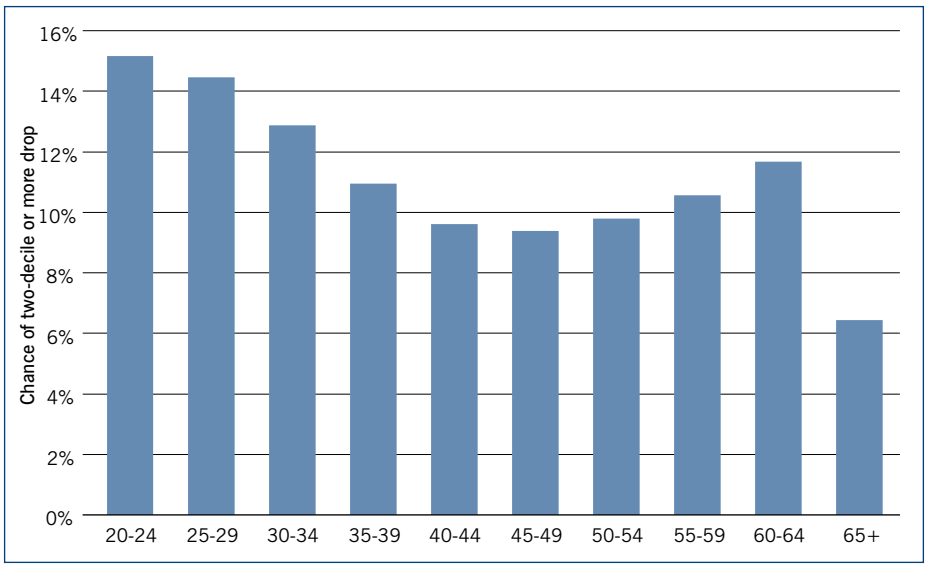


Figure 6: Average income volatility by age group, 2001–2014



Factors understating volatility

Although we do not see a clear secular trend in income volatility over the period of 2001 to 2014, both the level of volatility and its concentration among income groups and between genders presents an interesting picture. There are a number of limitations to this analysis which might understate the level of income volatility among New Zealanders.

Focusing on downward movement between income deciles, and excluding shifts of only one decile, means that this analysis excludes deciles 1 and 2. This approach means that we do not capture falls in income experienced by the bottom 20% of income earners, who do not have two income deciles below them, but for whom any significant decrease in income would be a considerable shock. The overall volatility of incomes in New Zealand is also understated by not including absolute decreases in income that do not result in someone changing income brackets. For instance, someone at the top end of decile 5 could suffer a fall in income of $5,000, but still remain in the same decile bracket.

It should also be noted that this analysis, along with most international studies, is focused on inter-year volatility. A growing international literature is focused on intra-year volatility, most typically through measuring variances in month-to-month incomes (Bania and Leete, 2009; Hills, 2015). This is often closely associated with the 'gig economy', which involves non-traditional employment around short-term tasks, projects or relationships with clients, and often utilises online platforms (Bughin and Mischke, 2016).

Month-to-month volatility poses a different set of challenges to a substantial shock to income from one year to the next, which might be associated with a period of unemployment or serious illness. A single major shock might be smoothed out through drawing upon savings for those fortunate enough to have them (for a transitory shock), or require a challenging but manageable adjustment in lifestyle (for a permanent shock). However, month-to-month variations in income require a constant process of budgeting, exhausting and restoring financial buffers and the greater

likelihood of an ongoing reliance on debt, possibly at high interest rates. Informal assistance from friends and family members is another source of buffers for unstable short-term incomes, though not everyone has this option available.

Furthermore, an individual living off an income that is both low and variable is likely to face an ever-shifting entitlement to social assistance. This is important, first of all, because some entitlements require that workers are in a job for a certain period of time before they are available (i.e. sick leave, parental leave). Having an adequate knowledge of one's entitlement to assistance, and the time and complexity associated with claiming it, can also pose considerable barriers for some people. In September 2017, TV3's *The Nation* reported that, according an Official Information Act request, difficulties around claiming benefits meant that approximately $200 million each year was not received by families who were entitled to receive it.[4]

Discussion

There are two main areas arising out of this analysis that this article shall address. The first is to explore the position of income volatility in relation to the more well-established work on income mobility. The second is to put these findings in a broader context of economic and social trends, and offer some tentative answers as to why income volatility in New Zealand looks the way it does.

Income mobility – the relative or absolute movements in an individual's income over time – has become a topic of considerable academic interest in recent years. This has been parallel to work on income and wealth inequality, and connected to it in a number of ways. The rising or increased levels of income inequality in many advanced economies over recent decades has led to concerns about intergenerational mobility: that is, whether the concentration of rewards at the top of the income distribution is leading to the development of more rigid social classes, where one's chances in life are more closely tied to the socio-economic position of one's parents. In this context, income mobility is often seen as an indicator of equality of opportunity, though this is less true of (short-term) measures of intra-generational mobility than longer-term intergenerational studies (Corak, 2013).

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At the same time, income mobility is seen as offering a more nuanced understanding of the distribution of income in society than a static picture of the shares that different groups receive at a certain point in time. To put it another way, the level of income inequality over one's lifetime is likely to be less than at a single point in time. The argument here is that the implications of a less equal distribution of income might be different depending on the degree to which there is movement between income groups over time (Barker, 1996). For instance, a New Zealand Treasury paper notes that 'There is change in incomes between one year and the next, with over 60 percent of the population changing income decile group ... Only 22 percent stay in the same income decile group eight years later' (Carter, Mok and Le, 2014).

In some sense, income volatility presents the flip side of this story. At the superficial level of mental images, the level of income volatility discussed here may naturally evoke a picture of loss and misfortune. Yet it is important to bear in mind that upward relative movements between income deciles is the necessary corollary of downward shifts. In a similar sense, the work presented here on income volatility demonstrates that what is often presented as a positive story of income mobility also includes a significant level of downward shifts in income in *absolute* terms, not simply relative shifts.

This underscores an important point: a society marked by highly unstable incomes is likely to appear as a reasonably mobile society over the shorter run; however, over the longer run it is plausible that a society that does not deal with individual risk in an effective way will see initial disparities in life chances reinforced. As John Hills has detailed, the advantages of being born to affluent parents are not limited to the early years of life, but are reinforced throughout the life cycle, in the form of assistance with higher education, help with housing costs or the deposit for a house purchase, inheritance and other intra-family transfers of wealth (Hills, 2015). All things being equal, these advantages are likely to mean that their beneficiaries will deal with economic risk much better than those without such advantages – a proposition which is consistent with the higher concentration of income volatility among the lower-middle class.

As noted, downward shifts between income deciles must by necessity coincide with upward shifts by others in society. This raises the issue of the extent to which we can weigh these prospects against one another. It could be argued that individuals are to some degree compensated for the greater risk of downward shifts by the corresponding chance of upward movement.[5] For instance, Carter, Mok and Le (2014) found that in 2002 New Zealanders had an equal chance (6%) of their income increasing or decreasing by $20,000 or more in the following year.

It makes sense to take this offsetting upward mobility into account; however, there is good reason to view the risk of downward movements as a serious concern, notwithstanding any corresponding chance of upward movements in the same year. The first is people's tendency to experience loss

aversion, meaning that people tend to value avoiding a fall in their position more than they value an equivalent increase (Kahneman and Tversky, 1979). If we consider subjective well-being to be an objective of public policy, then this would tend to favour a lower volatility system.

The second reason is that it is unquestionably a lot easier to adjust household finances to an increase in income than a decrease. Many of our outgoings represent long-term, fixed commitments (for instance, mortgages and rental accommodation, education-related expenses, childcare), and having to unravel these obligations can be difficult, costly or disruptive to social networks and established relationships. We should also bear in mind the social and psychological costs that might be suffered in the course of this transition, if the end result is that a household experiences a greater degree of material deprivation.

Table 2: Comparison of loss associated with a two-decile drop vs wealth position by decile

Decile	Two-decile loss	Mean net worth ($)	Mean financial assets ($)	Mean cash in bank ($)
1		-$23,000	$400	$1,200
2		$3,200	$100	$700
3		$12,300	$200	$2,000
4	$8,035	$32,000	$600	$3,100
5	$8,590	$68,700	$1,600	$6,100
6	$13,410	$124,800	$2,700	$7,900
7	$18,655	$193,600	$3,600	$10,700
8	$21,940	$280,600	$6,400	$15,800
9	$28,110	$428,300	$14,400	$25,200
10		$1,289,700	$63,500	$69,100

Wealth data for 2010 from Rashbrooke, Rashbrooke and Molano, 2017 (data tables provided by authors).
Note: calculation of decile midpoints is based on 2014 data.

Social and economic context

It may be surprising to some that New Zealand does not exhibit the same observable increase in income volatility that has generally been found in other advanced countries. However, a number of points should be borne in mind. First, many of these (particularly US) studies find an increase in volatility that predates the scope of this analysis. A number of more recent studies have found a relatively stable trend over the period since 2000 (Hardy and Ziliak, 2014).

Second, labour market changes are often highlighted as a causal factor in trends in income volatility, and though New Zealand has undergone some significant transformations on this front, these also predate the years covered by LEED. One third of New Zealanders are in non-standard employment. However, the growth in part-time work largely took place in the late 1980s and 1990s, and the share of self-employed people has been relatively stable (Statistics New Zealand, 2014).

Third, it is possible that there are different trends for various components of incomes, as found by Jenkins (2011) with regard to data for the United Kingdom. Such divergences may act to offset one another, and disguise any underlying trend. Further work on disaggregating the components of income would provide greater insight on this point. However, it should be noted that the major welfare change in this era, the Working for Families tax package, is not captured by the data used here.[6]

This analysis provides an ex post view of disruptions to individual incomes. While we are not in a position to directly assess how effectively households can smooth volatility in individual incomes, some tentative comments can be made regarding what is known about options for offsetting income loss.

Rashbrooke, Rashbrooke and Molano (2017) provide evidence from as recently as 2010 on the wealth held by New Zealand households. Table 2 compares these findings with the midpoint income losses represented by a two-income decile fall (as set out in Table 1). Mean net worth is greater than the (minimum) income loss measured in this analysis for each decile, though this wealth is typically concentrated in housing equity. The two right-hand columns show the mean worth of more liquid assets: cash in the bank and financial assets. For deciles 4–7, the income loss is greater than the mean total of liquid assets. For decile 8, it is broadly equal.

Households are, of course, likely to smooth income losses through some combination of budgeting, drawing upon assets and borrowing. However, this comparison provides some context for the extent of the income loss that is measured in this study of income volatility, relative to the financial buffers that New Zealand households have available to them. The figures for wealth are at a household level, whereas the income volatility data is for individuals.

Partnering and forming a household provides an additional avenue of risk sharing (though obviously that is far from the only reason for doing so). The share of couples with dependent children who are both employed (as opposed to one or neither being employed) has actually risen steadily in recent decades. This rate was below 60% in 2000, and had reached the mid-60s by 2014 (though there has been an even larger increase in the years since 2014, to close to 70%; Statistics New Zealand, n.d.). This means that more households have more than one source of labour market income; however, it may also represent an increasing share of households that need two incomes to get by.

Conclusions and further research

This analysis has provided an indirect and tentative look at the incidence of income-related shocks, and the effectiveness of the institutional system in effectively dealing with this risk. The level, trend and concentration of income loss present an uneven picture. It does not appear that the aggregate level of volatility has increased since 2001. However, lower income groups face much greater chances of a substantial fall in income than higher income groups, but are likely to have fewer financial buffers and less resilience against economic loss. We also see very different

levels of risk between age groups and between genders, as well as within genders once income is taken into account.

There are a good number of areas where further research might add to our understanding of income volatility in New Zealand. Assessing the incidence of economic loss over a longer time period would give a better idea of how policy changes have affected the level of financial risk faced by New Zealanders. Matching up this work with a better understanding of how and when households can smooth their consumption in the face of income loss (and how this varies between different groups) would provide a much better indicator of how this aggregate level of volatility translates to outcomes for individuals and families. This includes intra-family transfers, and the implications of this for intergenerational mobility. And, as noted above, the volatility of inter-year incomes does not give us a good idea of how incomes are fluctuating over a shorter time frame, such as the measures of monthly volatility that are emerging internationally. The impact of changing work patterns and automation on the stability of household incomes is likely to be a major concern for the future.

Finally, although it is difficult to say what level of volatility ought to be considered acceptable within society, there are certainly patterns in the distribution of financial risk that should be cause for concern. Further work on how policy changes can provide greater economic security to households is therefore important. Individuals and households have diverse aspirations, and different things about their lives that they each hold dear. However, we all have a common interest in making sure that the inevitable incidence of misfortune within society does not unduly determine the course of our lives.

1 Homeownership in the CPI does not include the price of land. It therefore understates the price of homeownership.
2 All figures referring to decile bands are before tax, and refer to 2014 figures.
3 Decile 3, the lowest decile measured through this approach, has conversely very low volatility relative to other lower deciles. It is unclear how much of this is a limitation of the methodology at the bottom end of the income spectrum. For instance, an individual in decile 3 faces the possibility of falling up to two deciles at most, compared to someone in the fifth decile who can fall up to four deciles, and so on. The proportional drop for decile 3 falling to decile 1 would also be much greater than the equivalent fall for higher deciles.
4 http://www.newshub.co.nz/home/election/2017/09/winz-creating-two-classes-of-kiwis-labour.html; http://www.radionz.co.nz/news/election-2017/339064/winz-staff-accused-of-withholding-entitlements.
5 Thanks to Norman Gemmell for this point.
6 Such changes may have had a dynamic effect on other components of individual income, but the evidence on this suggests that this package had a positive impact on employment (Dalgety et al., 2010). Such changes would most likely be related to labour market income, and therefore visible in the data.

Acknowledgments

My thanks to Cassie Favager, Jeff Brandt, Jason Tabarias, Michael Macaulay and Ben Ogilvie for collaboration on the 2017 Deloitte/Victoria University 'state of the state' report, which was the basis for this work. Sarah Burr of Deloitte contributed the data analysis for this work. For comments, advice and helpful discussions, thanks also go to: Jonathan Boston, Simon Chapple, Arthur Grimes, Norman Gemmell, Girol Karacaoglu, Max Rashbrooke, Patrick Nolan, Jess Berentson-Shaw, Max Harris, Courtney Kemp, Andrea Fromm, Stephen Oakley and Liya Liyanage, as well as attendees at a Victoria University School of Government 'Brown Bag' seminar in September 2017.

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