Income protection in the New Zealand tax-transfer system

Research note 2021/01

Author: Penny Mok

NEW ZEALAND
PRODUCTIVITY COMMISSION
Te Kōmihana Whai Hua o Aotearoa

The New Zealand Productivity Commission

Te Kōmihana Whai Hua o Aotearoa[1]

The Commission – an independent Crown entity – completes in depth inquiry reports on topics selected by the Government, carries out productivity related research and promotes understanding of productivity issues. The Commission aims to provide insightful, well-formed and accessible advice that leads to the best possible improvement in the wellbeing of New Zealanders. The New Zealand Productivity Commission Act 2010 guides and binds the Commission.

Information on the Productivity Commission can be found on www.productivity.govt.nz or by contacting +64 4 903 5150.

How to cite this document: Mok, P. (2021). Income protection in the New Zealand tax-transfer system, New Zealand Productivity Commission Research Note 2021/X. Available from www.productivity.govt.nz

Acknowledgements: The author thank Patrick Nolan and Gail Pacheco from the New Zealand Productivity Commission who provided feedback on the initial draft. Also thanks to the A&I team from the Treasury for their data assistance and external reviewers for their comments.

Date: July 2021

JEL classification: H24, J21

ISBN:

[1] The Commission that pursues abundance for New Zealand

Abstract

Technology changes or external economic shocks may cause firms to shrink and/or exit the market while new firms might enter and create new jobs. This will inevitably cause some disruptions to workers and it is crucial to provide financial support as they look for work or upskill themselves. New Zealand rely on social welfare as a way of smoothing fluctuations in income due to job loss. To explore the level of income smoothing offered by the welfare system, it is useful to analyse the income-replacement rates, which is the loss of earnings being replaced by New Zealand social welfare. This paper uses a scenario approach to illustrate the population heterogeneity and differences of replacement rates that current benefit system provides for a few sets of hypothetical individuals and families. The selection of hypothetical individuals and families is based on the proportion of households in New Zealand to best represent the country's population and labour force. To fully capture the complexity of the tax and welfare system, the paper utilised the Treasury's microsimulation model, Tax and Welfare Analysis (TAWA) and are based on tax and transfer rules from April 2018 to March 2019.

In most family scenarios, the replacement rates are above 50 percent of the families' net income prior to job losses. The highest replacement rate is for sole parent earning median wage rate (at $25.50 per hour) where 79 percent of the net income from working is replaced by the net income obtained from the welfare system if the sole parent was made redundant. For a single person earning minimum wage (at $18 per hour), the replacement rate is 56 percent. Generally, replacement rates are higher for those with children and for those earning low and median wage rates. This finding is not surprising given the emphasis in the New Zealand tax-transfer system towards targeting assistance by income and the ages and numbers of children. Families with children and lower wage families are relatively more insulated from economic shocks.

Higher wage earners and people without children are mostly likely to face a large drop in income when their gross incomes fall. The replacement rate for a single person earning $50 per hour is 26 percent. In scenarios where both parents lose their jobs, the replacement rate for high income couples with dependent children is similar to couples each earning the median wages without children, which is about 47 percent.

Comparing these replacement rates with the unemployment insurance, the OECD average replacement rates for the unemployment insurance sit around 60 and 40 percent after 2 months and 1 year of unemployment, respectively. The replacement rates and the design of unemployment insurance scheme vary widely across countries. For a single individual who previously earned the average wage in Denmark, the payment is around 58 percent of his/her prior income. Generally, payments are higher for individuals with dependent children and lower wage earners. Most workers in Canada receive around 55 percent of their prior earnings, up to an insurable income cap and for a certain amount of time.

Contents

Tables

Figures

1 Introduction

Technology changes or external economic shocks may reduce the demand for some types of jobs or goods and services. These potentially may cause firms to exit the market and the goods and services are replaced by cheaper and more effective alternatives. When firms shrink and exit the market, workers are displaced and new firms may, at the same time, enter the market and create new jobs. This temporary transition will inevitably cause some disruption to workers and hence income support, either through redundancy payment, social welfare or private insurance is crucial to financially support workers as they look for work or up/re-skill themselves.

New Zealand Productivity Commission (NZPC) has undertaken an inquiry into technological change and the future of work in 2019 and part of the inquiry looked at the income support for displaced workers in New Zealand (NZPC, 2019). This paper is one of a number of research inputs into the Commission's inquiry and is focused on the tax and transfer system in New Zealand prior to Covid-19.[2]

New Zealanders rely on social welfare as a way of smoothing fluctuations in income due to job loss. There has been renewed interest in the idea of unemployment insurance as an alternative way of income smoothing. As background to these debates this paper considers the level of income smoothing provided by existing tax-transfer programmes and hence the "policy problem" that unemployment insurance is supposed to address. This is important as making informed judgements requires an understanding of key empirical results (Creedy, Mercante & Mok, 2018). Due to the nature of the tax and transfer system in New Zealand, income protection gap cannot be understood without understanding population heterogeneity such as family structure and labour market patterns; how current tax and transfer policies offset fluctuations in income; and the main objectives of the welfare state.

In order to explore the level of income smoothing offered by the welfare system it is useful to analyse the income-replacement rates, which is the loss of earnings being replaced by New Zealand social welfare. Income replacement rates differ depending on the composition of individuals and families, hours of work and spouses' incomes.

This paper uses a scenario approach to illustrate the population heterogeneity and differences of replacement rates for a few sets of hypothetical individuals and families. The selection of hypothetical individuals and families is based on the proportion of households in New Zealand to best represent the country's population and labour force. To fully capture the complexity of the tax and welfare system, the paper utilised the Treasury's microsimulation model, Tax and Welfare Analysis (TAWA) and are based on tax and transfer rules from April 2018 to March 2019.

The remainder of the paper proceeds as follows. Section 2 outlines the concepts and the country's social welfare system. Section 3 discusses the results and Section 4 concludes.

[2] For other research inputs, refer to https://www.productivity.govt.nz/inquiries/technology-and-the-future-of-work/

2 Income protection

An income protection gap indicates the degree to which a family or individual is not protected from a risk. These risks can include loss of job, injuries, illness or damage to property. Protection can be provided by a range of mechanisms, such as private insurance or through government transfers. In New Zealand, private insurance companies and banks offer income protection insurance but mainly were sought by individuals to cover situations of illness where there is no coverage by the public accident insurance scheme i.e. Accident Compensation Corporation (ACC). This is due to the substantial differences in pay-out rates between redundancy and illness income protection insurance, the restricted duration and the limited supply of redundancy insurance market (OECD, 2017). These issues point to the moral hazard and adverse selection resulting in the failure of private redundancy insurance in New Zealand. For example, workers would have superior knowledge about their potential job loss than the insurance companies and this will hinder the development of the private market for unemployment insurance. The private insurance market failure is often a rationale for policy intervention to seek public solutions for the problem.

To understand the merits of a policy, it is useful to discuss how social assistance and unemployment insurance systems smooth incomes, how they impact incomes of different individuals and families, particularly the most vulnerable group in the society and the trade-offs. Government would need to balance the trade-offs between the level of financial assistance and the fiscal costs and potential disincentives towards finding employment. This is important as making informed judgements requires an understanding of key empirical results (Creedy, Mercante & Mok, 2018). Both social assistance and social insurance systems smooth incomes in different ways. A social assistance system provides a level of support below which families cannot fall, but which is not based on previous earnings or work history. Families are thus protected from "catastrophic" losses of income but for some higher income earners the fall in income can be large. In contrast, unemployment insurance systems provide assistance based on previous earnings or work history. This section aims to provide a brief overview of the unemployment insurance implemented by other OECD countries and current New Zealand social welfare system.

2.1 Unemployment insurance

With the exception of New Zealand and Australia, most OECD countries have unemployment insurance schemes where eligibility for support and the rate of support is broadly tied to a person's prior income and contributions. Most OECD countries with the scheme require a minimum cumulative duration of employment or contributions over a given prior period. These may be three months employment in the last 12 months in Iceland to 12 months in the last 24 months in Austria and Portugal. This condition is aimed to re-qualify people if their insurance entitlement has been exhausted by an earlier period of unemployment (Fletcher, 2015).

The design of unemployment insurance scheme varies in most OECD countries. Participation in most countries with unemployment insurance are compulsory, either through automatic coverage of a state-provided scheme funded via payroll tax or compulsory employer and employee levy. Countries like Denmark and Sweden have voluntary schemes where they are linked to trade union membership. In some countries, casual, part-time workers and self-employed are not required to participate and hence they are usually not covered by the scheme (see OECD, 2017; and Fletcher, 2015).

In Denmark, there are about 24 private unemployment insurance insurers operating under government regulation. Generally, individuals are qualified for payments once they have contributed to the scheme for at least one year. Employees contribute around 8 percent of earnings, which is the highest rate in the OECD. There is a maximum payment of not more than 90 percent of prior earnings, up to 24 months within a three-year period. For a single individual who previously earned the average wage, the payment is around 58 percent of his/her prior income. The replacement rate rises to 83 percent for singles whose prior earnings was two-thirds of the average wage. Generally, payments are higher for

individuals with dependent children but lower for under-25 year olds and recent graduates (NZPC, 2019).

Whereas in Canada, the unemployment insurance scheme covers displaced seasonal and permanent employees who have worked 700 hours in the past year. Employees contribute 1.62 percent of earnings while employers pay $1.40 for each $1 employees pay. Most workers receive 55 percent of their prior earnings, up to the cap of $CAN53,100 at which payments are $CAN562 per week. Payments are made for a maximum period of 45 weeks, or less in regions with low unemployment or if recipients have not worked sufficient hours in the previous year (NZPC, 2019). For detailed comparison of unemployment insurance schemes in the OECD countries, see Fletcher (2015).

Relying on previous earnings or work history means that for some families, their incomes when out-of-work may closely match the income when in-work, but this comes at the cost of potentially leading to gaps in coverage. This is true for people with broken contribution histories such as parents who take time out of the labour force to look after children or people working in the informal segments of the labour market. This could also potentially reinforce inequalities in the labour market due to the gender wage differences.

There has been renewed interest in the idea of unemployment insurance as an alternative way of income smoothing. This paper will not discuss the implementation options for the unemployment insurance, the inefficiency and welfare cost created by adverse selection in the private insurance market and common forms of public intervention (see Einav and Finkelstein, 2011). Nonetheless, such analyses and discussions are useful to understand the trade-offs of the policy and for potential public policy interventions.

2.2 The New Zealand welfare system

New Zealand has been classified as a liberal or residual welfare state on the basis of its degree of welfare effort, reliance upon targeting, strict entitlement rules, and emphasis on work for poverty relief (Esping-Andersen, 1990). Other liberal welfare states include Australia, Canada, the United Kingdom, and the United States. Even within this group of liberal welfare states important differences exist. For instance, New Zealand and Australia place heavy reliance upon non-contributory social assistance programmes provided without time limits for eligibility for assistance. Canada, the United Kingdom, and the United States all use a mixture of contributory social insurance and non-contributory social assistance programmes, with the United States placing the greatest emphasis on time limits for eligibility for assistance.

The focus on a social assistance approach in New Zealand and Australia reflects a number of policy settings and assumptions regarding family structures when first set up (Nolan, 2005). The development of New Zealand's tax-benefit system following World War Two was in an economic and social environment of low and generally short-term unemployment and where couples with children and a single male breadwinner were the most common family type. The social assistance system developed alongside policies that aimed to achieve full employment and to ensure adequate market incomes for male breadwinners in families. Social assistance programmes were funded with progressive taxation and were generally provided on an income- or asset-tested basis. Key exceptions to this income testing were the provision of the universal Family tax credit and universal pensions. New Zealand has also adopted a social insurance approach to workplace and other accidents where the Accident Compensation Corporation (ACC) provides up to 80 percent of the taxable income before the injury, with a maximum amount of compensation a year.

Over time, policy changes shifted social support in New Zealand away from the traditional Australasian model of worker income support towards the Swedish model of government expenditure support (Nolan, 2018). However, New Zealand’s focus on targeted support compared to the more universal payments in Sweden remained in place and was in fact reinforced after 1991. Consequently, the New Zealand benefit system can be viewed as having three tiers of assistance. The first tier is made up of the

main benefits. The second tier is made up of cost related payments: Working for Families (WfF); Accommodation Supplement (AS); and childcare assistance (CCA). The third tier includes hardship payments (e.g., unrecoverable special needs grants, or recoverable interest free loans/benefit advances) and payments related to employment intervention. The second and third tiers can be grouped together and are often termed supplementary assistance (details see Nolan, 2018 and WEAG, 2019).

In New Zealand welfare system, a set of general eligibility requirements applies to most of the payments although different types of payments often have different requirements. These general eligibilities are related to residency status, family as unit of assessment, means tests and stand-down periods (WEAG, 2019). As the main benefit payments are based on total family income within a household, the rates of payments are generally determined by family-type such as singles, sole parents, and couples with and without dependent children. This paper uses the term family and household interchangeably. For detailed welfare system in New Zealand, see WEAG (2019a).

Welfare system in New Zealand is not tied to a person's prior job history or the reasons for unemployment. Individuals who were previously self-employed, casual or on fixed-term are eligible for the support. Individuals who experience long-spells of unemployment will continue to receive the same amount and this provides some certainty and protection to them.

However, recent review of the welfare system by the Welfare Expert Advisory Group (2019) revealed several issues in the system. These include the complexity of the system and low take-up of some benefits. As mentioned earlier, the welfare system aims to support people in a multitude of circumstances and targets to those needed it. As a consequence, this creates a complex system which can be difficult for a normal layperson to understand and navigate and is expensive to administer. People on the lowest income who often have few resources to help them navigate this complexity are the most impacted. The lack of understanding of the eligibility, the complicated interaction with other aspects of the tax and transfer system, and costs associated with information, social and psychological create huge barriers to take-up some of these benefits such as AS and CCA. It was estimated up to around 100,000 people who are eligible for AS are not receiving it. Most of the people not receiving AS are likely to be non-beneficiaries (WEAG, 2019b).

2.3 Comparison to OECD

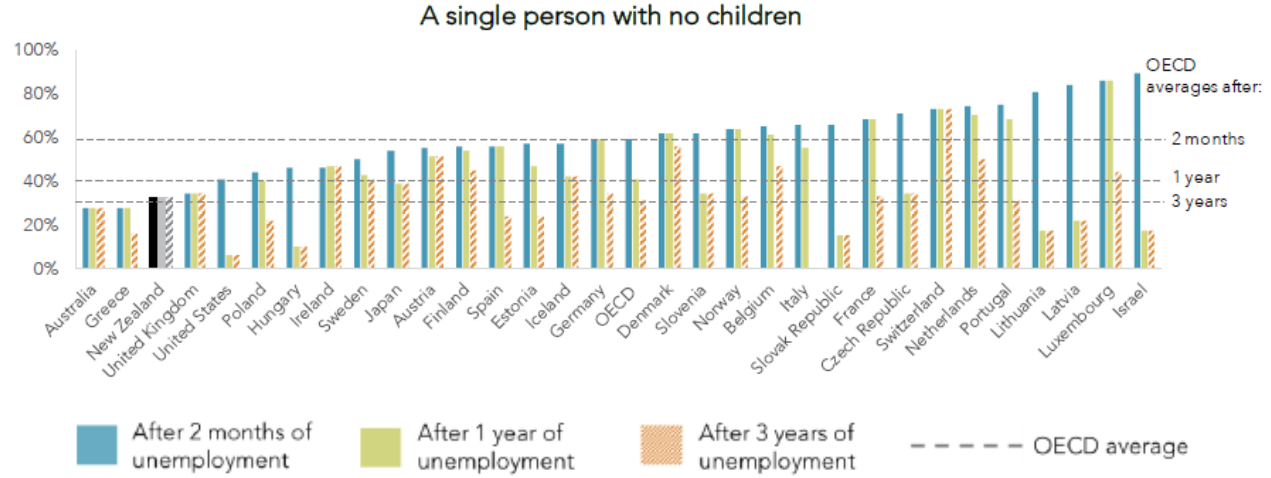
In most OECD countries, unemployment insurance is limited in time. People who stay unemployed for several years will move onto other and in most cases lower welfare payments (OECD, 2017). The maximum duration of unemployment insurance payments varies across countries but generally falls between 6 to 24 months. Replacement rate is a good way to compare the level of income security across countries. It measures the person's family income when not working as a proportion of their family income when working. This includes partner incomes but excludes personal savings and redundancy payments. It shows the fall in a person's income when they loss their job.

Figure 1 shows the replacement rates of countries in the OECD, using a standard family approach of a single 40 year-old male with continuous employment history and earning average wage (see NZPC, 2019). Within the first year of being unemployed, New Zealand has the third lowest replacement rates (Australia being the lowest). Both Australia and New Zealand do not have unemployment insurance scheme, they rely on social welfare to smooth income between employment spells. The replacement rates vary widely across countries and most countries pay between 50 to 70 percent of earnings in the first year of unemployment. The OECD average replacement rates sit around 60 and 40 percent after 2 months and 1 year of unemployment, respectively.

Having an unemployment insurance scheme does not mean high income-replacement rates. The United States (US) has a federal scheme that provides similar levels of support to New Zealand's unemployment benefit (Jobseeker support), with some supplementary from the states level. The

replacement rate was initially high at 40 percent after two months of unemployment in the US but it falls substantially after the scheme ended, where the replacement rate after one year of unemployment is below New Zealand's.

Figure 1 Replacement rate for a person previously earning average wage, 2018



Source: NZPC, 2019.

Note: The average wage used for New Zealand is $US59,970.

In a longer timeframe of 3 years, New Zealand's replacement rate is above the OECD average. As mentioned above, individuals in New Zealand who experience long spell of unemployment will have a relatively stable level of support providing them some degree of certainty and protection. Many countries with the insurance scheme in the OECD see a substantial fall in the income replacement rates. This is because of the limited duration coverage of the unemployment insurance scheme in most economies. Countries such as Israel and Lithuania will have a substantial fall in the income replacement rates after unemployment insurance end while countries like Switzerland and Denmark remain relatively high for some years.

Comparison across OECD countries using the analysis above is useful but financial assistance systems and unemployment insurance schemes vary widely across countries. It is common to use average wage to understand the level of income replacement rate and determine the payment but this mask substantial heterogeneity in the society. Using the average wage as a benchmark would potentially set the benefit or payment level too high for workers who previously earn lower wage (i.e. minimum or median wage rate).[3] This may have unintended consequences such as disincentive to work and delay beneficial labour reallocation. It would be more insightful to analyse the replacement rates via the budget constraints (or net incomes), particularly of minimum and median wage earners whose welfare are of particular interest to policymakers. This paper uses the term budget constraints and net incomes interchangeably. Section 2.4 below provides explanation on budget constraints.

2.4 Budget constraints and replacement rates

This paper assumes that everyone has the same degree of risk aversion. In reality, some people are more willing to bear risk than others and the shape of a persons' utility of wealth curve can tell us about their attitude towards risk (degree of risk aversion). The more rapidly a person's utility of wealth diminishes, the more risk averse that person is. For instance, a risk neutral person cares only about

[3] Average annual wage income of New Zealand is $82,000 and median wage income is around $52,000.

expected wealth and does not mind how much uncertainty there is. In practice it is difficult to measure individuals' degree of risk aversion.

Based on the assumption of uniform risk aversion, the income risk from a job loss is estimated using budget constraints. Budget constraints show the net income after taxation and the payment of abated assistance that is received at different levels of time in paid employment. Net income when out of work is the height of the budget constraint at zero hours of work.

To illustrate the risk of job loss, the income at each hour of work is compared to the income at zero hours of work. The difference between these two incomes shows the income "at risk." The use of the zero hours income as a counterfactual assumes that the risk that people face relates to moving between the current hours of work and exiting the labour market. It is possible, however, that people face a reduction in hours of work but still have positive hours of work. The estimates of risk in this paper should thus be seen as maximums. Income replacement rate is estimated based on the person's household net income when unemployed as a proportion of their household budget constraint when employed. This shows the fall in a person's income (or income gap) when they move from employment to being unemployed.

Budget constraints are usually highly complex, reflecting the complexity of the interaction of personal income tax policies, main welfare benefits, and supplementary welfare assistance. A consequence of this complexity is that marginal tax rates will often vary by hours of work, so that individuals with the same gross income (reflecting both gross wage rates and hours of work) may face different labour supply incentives. Modelling changes in budget constraints by hours of work for fixed gross wage rates can isolate the impact of marginal tax rates on financial incentives for labour supply decisions. Differences in labour supply responses not only reflect differences in the marginal tax rates that individuals face but also differences in individuals' preferences. To model the labour supply responses, a behavioural microsimulation model with econometric estimates of wages and preference functions for New Zealand is needed (Creedy, Mercante and Mok 2018; Mercante and Mok 2014a and 2014b). Labour supply responses will not be discussed in this paper.

This paper utilises the Treasury's static non-behavioural microsimulation model, TAWA.[4] The strength of this model is in its ability to apply a wide range tax-transfer programmes to a wide range of family types. The welfare transfers considered in this paper are mainly the first and second tier assistance, with the exception of the childcare assistance which is not available in the model. Further description of the transfers eligible for each family is explained in Section 3.

The paper also assumes that the only margin at which the labour market changes take place is hours of work. Wage rates are assumed to be fixed. More detailed econometric modelling potentially using the Linked Employer-Employee Dataset (LEED) would be needed to assess the degree to which wage rates change in response to factors such as technological change.[5]

2.5 Scenario families

This paper uses a scenario family approach where the income at risk from job loss is modelled for a selected number of hypothetical individuals and families. A key challenge with such an approach is to identify the correct scenarios. Results will be largely meaningless unless they relate to cases that are particularly common and/or important for policy reasons. The outcomes for a case that is unlikely to exist are not useful to understand the operation of the social security system.[6]

[4] For information on the model, see https://www.treasury.govt.nz/information-and-services/financial-management-and-advice/revenue-expenditure/tax-and-welfare-analysis-tawa-model

[5] There is currently little evidence in New Zealand on the degree to which technological change has led to changes in hours of work. The lack of data on hours of work is a major gap in New Zealand's labour market statistics. From March 2020 the Inland Revenue Department has been routinely collecting these data via payday filing software, although these data will not be backdated and so will be of limited value for several years.

[6] The exception to this is, of course, where a family would have particularly characteristics (e.g., hours of work) but are discouraged from doing so by the social security system. In this case the absence of families with these characteristics is a key outcome of the social security system.

To help inform the selection of scenarios, the shares of different households in New Zealand were considered using the Ministry of Social Development's most recent *Household Incomes Report* (Perry, 2019). The data from this report presented in Table 1 shows that couples with dependent children represent about 35 percent of New Zealand population while sole parents with dependent children represent about 6 percent of the country's population.

While sole parents are a relatively small group, 51 percent have disposable equivalised income in the lowest quintiles (which is the lowest 20 percent of the income distribution) while the household incomes for couples with dependent children mostly sit at the second and third quintiles. Singles without children have the second highest rate of poverty, and couples and family households without children have the lowest rates of poverty.

Table 1 Distribution of individuals across income quintiles by household types

Household type	Share in quintile 1	Share in quintile 2	Share in quintile 3	Share in quintile 4	Share in quintile 5	Individuals ('000)
Sole parent	51	26	17	4	1	269
Couples with children	15	26	23	20	16	1,653
Other family households with children[2]	22	26	29	17	6	441
Couples without children	10	7	15	25	43	493
Family household without children	11	15	18	27	29	794
Non-family[2]	17	18	19	26	21	314
Singles	31	12	20	22	16	169
All	20	20	20	20	20	4745

Source: Perry, 2019

Notes:

1. These show percentages of individuals in the household income distribution before housing costs. The percentages sum to 100 percent across rows
2. Other family households with children refers to family other than sole parent and couples with children while non-family household are unrelated individuals living in a same household.

The selection of the families or households are based on a set of households that represent the majority of those in the labour force. These households vary by civil status, incomes, accommodation costs and number of children. Rents paid are based on Auckland prices. The median and minimum wages are those for 2019. Below are the eight scenarios chosen:

- Sole parent with two children, earning the median wage rate of $25.50 per hour, living in Auckland and paying rent of $560 a week.
- Sole parent one child (new-born), wage rate of $25.50 per hour, living in Auckland and paying rent of $410 a week.
- Dual income couple with two children, both earning wage rates of $18.00 per hour, the principal earner works full time and the other part time, living in Auckland and paying rent of $560 a week.

- Dual income couple with two children, both earning the median wage rate of $25.50 per hour, the principal earner works full time and the other part time, living in Auckland and paying rent of $560 a week.
- Dual income couple with two children, the principal earner earns wage rate of $50.00 per hour and works full time, the second earner receives the median wage rate of $25.50 per hour and works part time, living in Auckland and paying rent of $560 a week.
- Dual income couple without children, both earn the median wage rate and work full time, living in Auckland and paying rent of $560 a week.
- Single person, wage rate of $18.00 per hour, living in Auckland and paying rent of $375 a week.
- Single person, wage rate of $50.00 per hour, living in Auckland and paying rent of $375 a week.

A detailed description of how the families' incomes are affected by different taxes and transfers are discussed for each scenario, as this provides a picture of the risk from a loss of earned income that these families face.

3 Results

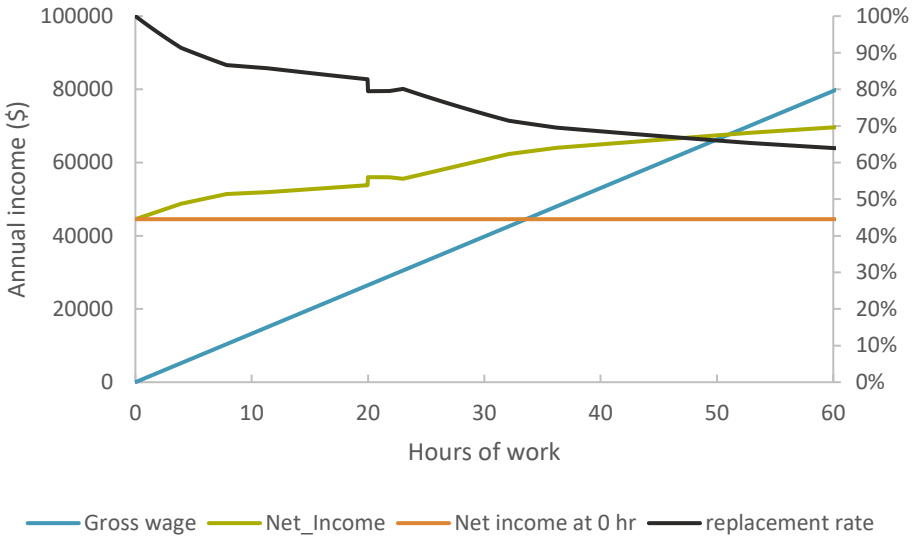
The findings below are estimated based on Treasury's microsimulation model, which looked at the interaction of a range of tax and benefit programmes for individual families.[7] The transfers considered in this paper are mainly first and second tier assistance, which excludes childcare assistance CCA. Full take-up of benefits is also assumed. The analyses are based on tax and transfer rules from April 2018 to March 2019.

3.1 Results for individual scenarios

Scenario 1: Sole parent with 2 children, working 20 hours at wage rate of $25.50 per hour, living in Auckland, and paying rent of $560 a week

It is assumed that the sole parent has a wage of $25.50 per hour, lives in Auckland and pays rent of $560 per week. This person's budget constraint is shown in Figure 2.

Figure 2 Budget constraint and replacement rate for Scenario 1



The gross wage shows the income this person would receive at a range of hours of work, up to 60 hours per week before personal income tax and benefit transfer. The net incomes are disposable incomes after the personal income tax and transfer structure is applied. For sole parents who are not working, they mainly receive benefits or tax credits from Sole Parent Support, Accommodation Supplement, Winter Energy Payment and Family Tax Credit payment which is a part of Working for Families (WfF). These are reflected in the net income at zero hour. As this sole parent works more hours, the net income changes reflecting the income tax and abatements of the benefits and tax credits.

Income replacement rate is calculated based on a person's family income when unemployed as a proportion of their family income when employed. This measures the fall or gap in a person's income when they lose their employment. The higher the income replacement rate the lower the risk of a financial loss from unemployment. Note that these figures do not include a number of costs associated with work (e.g. childcare cost, travel to the office), and so may understate the income replacement rates.

[7] The Treasury has generously made its microsimulation model available to the authors to undertake this work. This work has been undertaken independently of the Treasury and so should not be seen as reflecting the view of the Treasury. Any errors or omissions are solely the responsibility of the authors.

One standard for unemployment insurance is to provide a 50 percent replacement rate (e.g., reduce the fall in income from a loss of work to 50 percent of the income when in work). For this sole parent working 20 hours a week at the median wage rate of $25.50, the annual net income is around $56,000. If this sole parent is made redundant, the annual net income is about $44,500. Hence, the income replacement rate is 79 percent. The replacement rate is unlikely to drop to below 50 percent, except at very high hours of work (above 70). If the person works longer hours losses his/her job, the replacement rate will be lower.

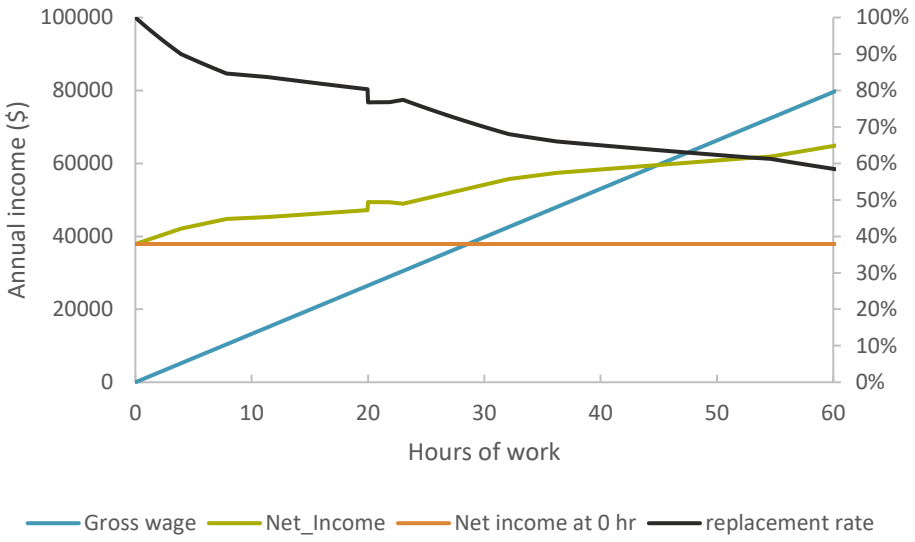
Note that the non-convex in net income at 20 hours of work is mainly associated with the In-work tax credit which is a part of the WfF where the sole parent is eligible if he/she works at least 20 hours a week and not receiving any main income-tested benefits (details see Creedy, et al 2018).

The assumed wage rate for this scenario is relatively high for this family type. Lowering the wage rate would tend to "elongate" the graph, e.g., the income replacement rate would fall at a slower rate. Likewise, given the value of child-based assistance, when the number of children in the family increase the income replacement rate is also likely to increase. It is thus possible to conclude that there would be few cases where sole parents with two or more children would face more than a 50 percent drop in income from a loss of work.

Scenario 2: Stay home sole parent with a new-born, potential wage rate $25.50 per hour (if works), living in Auckland and paying rent of $410 a week

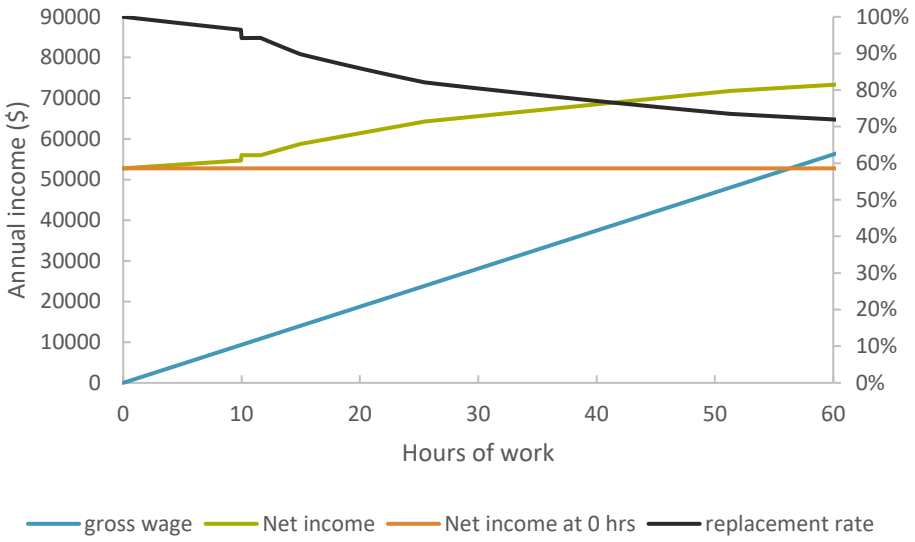
The second scenario is shown in Figure 3. This sole parent is eligible to receive the Sole Parent Support, Best start payment for his/her new-born, Winter Energy Payment, Accommodation Supplement and Family Tax Credit. The annual net income for this non-working sole parent is about $38,000. If this sole parent works at 20 hours a week and was displaced, the income replacement rate is 77 percent which is slightly lower than Scenario 1 (79 percent), mainly due to the difference in the family tax credit received. Both sole parents at Scenario 1 and 2 are eligible for In-work tax credit at 20 hours of work but will receive different amounts of family tax credit depending on the number and age of their child(ren). Similar to the earlier scenario, the income replacement rate for this sole parent is unlikely to drop to below 50 percent if he/she losses a job. If the sole parent works at 40 hours a week, the income replacement rate is 65 percent.

Figure 3 Budget constraint and replacement rate for Scenario 2



Scenario 3: Couple with 2 children, both parents earning $18.00 per hour, spouse working 20 hours a week, living in Auckland and paying rent $560 a week

Figure 4 Budget constraint and replacement rate for principal earner of Scenario 3

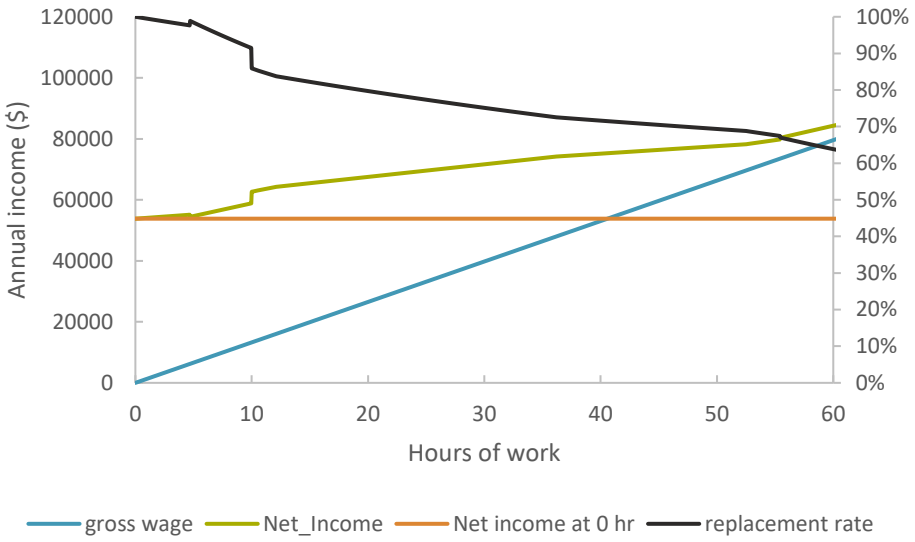


The budget constraint and replacement rate shown in Figure 4 represent the principal earner's, where the spouse works 20 hours a week. When the principal earner is not working, the couple is eligible for Jobseeker Support, Accommodation Supplement, Winter Energy Payment and Family Tax Credit. When the principal earner works at 40 hours a week at $18 per hour, the family annual net income is about $68,500. If the principal earner losses his/her job (at 40 hours of work) and assuming that the spouse is still working at 20 hours a week, the family annual net income will be about $52,700. The replacement rate for this family is around 77 percent. If both are made redundant, the family net income is approximately $47,100 and replacement rate is around 69 percent. Figure 4 shows fixed scenario for the couple where the spouse works 20 hours a week. Separate analysis is required to analyse the net incomes for non-working couples.

The non-convex in net income at 10 hours of work is associated with the In-work tax credit where the couple is eligible if both work at least 30 hours a week and not receiving any main benefits. In this scenario, the family will receive the In-work tax credit at the combined 30 hours of work where the principal and spouse work 10 and 20 hours respectively.

Scenario 4: Couple with 2 children, both parents earning $25.50 per hour, spouse working 20 hours a week, living in Auckland, paying rent of $560 a week

Figure 5 Budget constraint and replacement rate for principal earner of Scenario 4



The budget constraint and replacement rate shown in Figure 5 reflect similar household as Scenario 3, except that the couples earn higher wage rates of $25.50 per hour. This rate is closer to New Zealand's median wage. When the principal earner works at 40 hours a week, the family annual net income is about $75,100. When the principal earner is not working, the couple is eligible for similar benefit payments as the family in Scenario 3 but with slightly different amounts depending on the income earned by the spouse. If the principal earner losses his/her job (at 40 hours of work) and assuming that the spouse is still working at 20 hours a week, the family net income will be about $53,800. The replacement rate for this family is around 72 percent. If both are made redundant, the family net income is exactly the same as family in Scenario 3 (about $47,100) and replacement rate is around 63 percent. The replacement rate for this family is lower than the family in Scenario 3 mainly due to differences in wage rates.

Scenario 5: Couple with children, principal earner earning $50.00 per hour and spouse working 20 hours a week at $25.50 per hour, living in Auckland and paying rent of $560 a week

Figure 6 Budget constraint and replacement rate for principal earner of Scenario 5

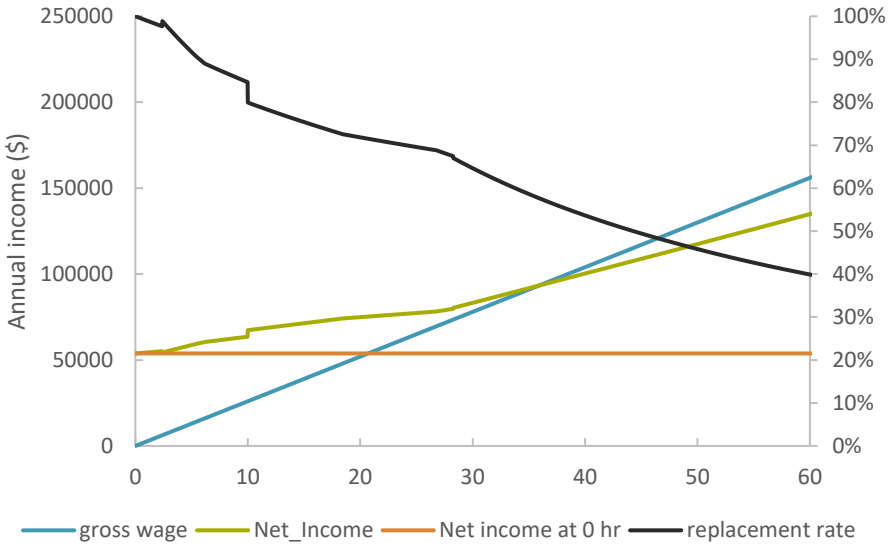
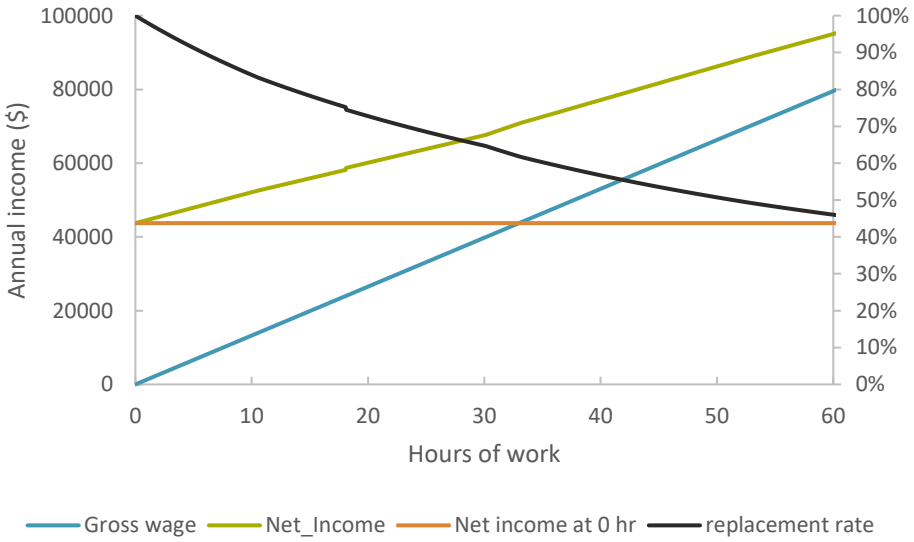


Figure 6 represents budget constraints and replacement rates for couple with higher wage rates. For this couple, the principal earner earns $50.00 per hour while the spouse works 20 hours a week at $25.50. Since the spouse's wage rate is identical to Scenario 4, the family annual net income for non-working principal earner is identical to the family in Scenario 4. Assuming that the principal earner works at 40 hours and the spouse works 20 hours, the family annual net income will be about $100,300. The replacement rate for this family if the principal earner loses a job is 54 percent. If both loses their jobs, the net income would be identical to the families in Scenario 3 and 4. Hence, the replacement rate would be 47 percent. For this family, the replacement is the lowest of the three couple scenarios presented.

Scenario 6: Couple without children, both earn the median wage rate $25.50 per hour and spouse works 30 hours a week, living in Auckland and paying rent of $560 a week

Figure 7 below shows a couple without children and where the spouse is assumed to work 30 hours a week. If both work at 30 hours a week, the family annual net income is around $67,600. If the principal earner is not working, the family is only eligible for Accommodation Supplement and Independent earner tax credit. The net income would be $43,700. The replacement rate if the principal earner loses the job is 65 percent. If both are made redundant, the net income would be $31,600 hence the replacement rate is only at 47 percent.

Figure 7 Budget constraint and replacement rate for principal earner of Scenario 6



Scenario 7: Single person, wage rate of $18.00 per hour, living in Auckland and paying rent of $375 a week

Figure 8 Budget constraint and replacement rate for Scenario 7

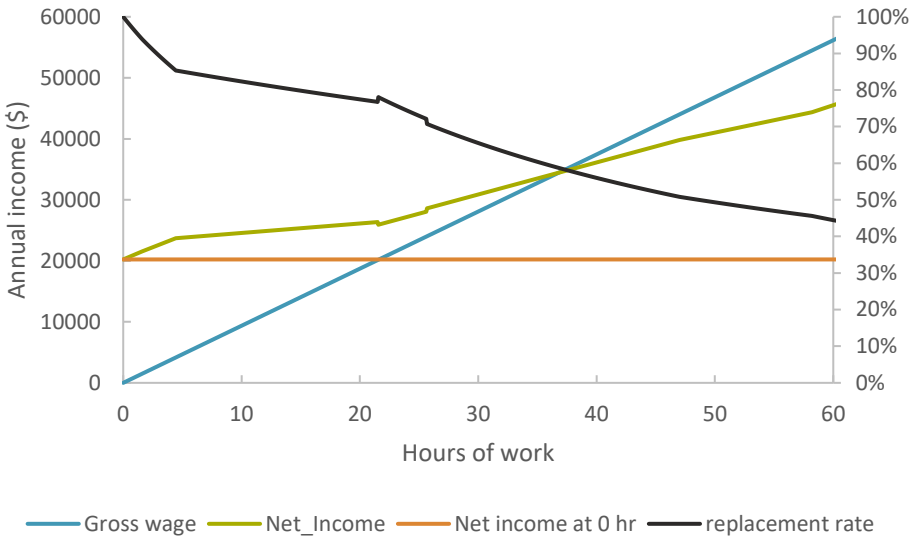
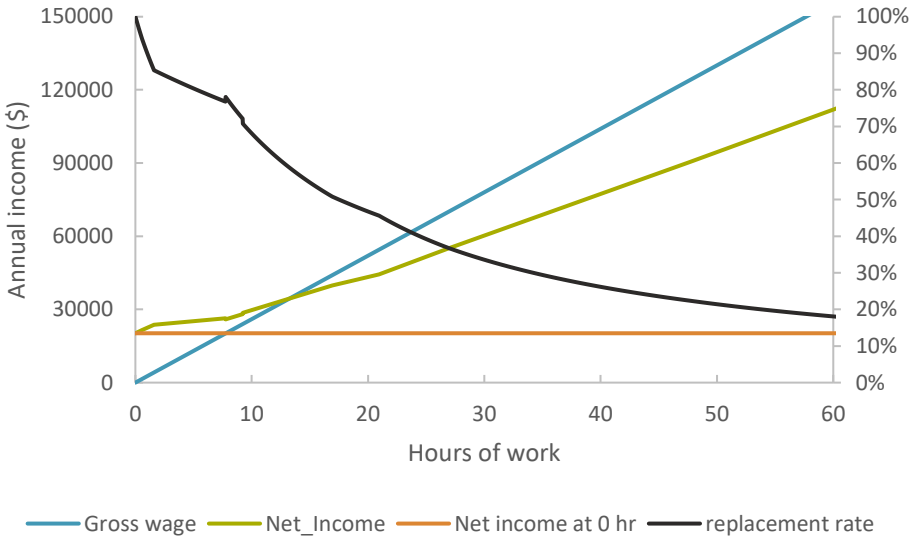


Figure 8 and Figure 9 illustrate the budget constraints and replacement rates for a single person with low and high wage rates. When these two different single persons are not working, both are entitled for the same welfare benefits: the Jobseeker Support; Winter Energy Payment; and Accommodation Supplement. The annual net income is around $20,200. For the minimum wage earner working at 40 hours a week, the replacement rate is 56 percent. On the contrary, the replacement rate is much lower for a single person earning $50 per hour at 26 percent.

Scenario 8: Single person, wage rate of $50.00 per hour, living in Auckland and paying rent of $375 a week

Figure 9 Budget constraint and replacement rate for Scenario 8



3.2 Summary of results

Table 2 below summarises the income replacement rates for all scenarios above, sorted from highest to lowest replacement rates.

Table 2 Modelled households and their replacement rates

Household	Characteristics and scenario	Replacement rate (% if principal earner loses job)	Replacement rate (% if both parents lose job)
1	Sole parent with 2 children. Parent works part time (20 hours a week) for the median wage ($25.50/hour). Weekly rent $560.	79	-
2	Couple with 2 children. One parent works full time (40 hours a week), the other part time. Both earn the minimum wage ($18/hour) with weekly rent $560.	77	69
3	Sole parent with a new-born. Previously worked full time at median wage but now stays at home. Weekly rent $410.	65	-
4	Couple without children, both working 30 hours a week for the median wage. Weekly rent $560.	65	47
5	Couple with 2 children. One parent works full time, the other part time. Both earn the median wage. Weekly rent $560.	72	63
6	Single person, who works full time for the minimum wage. Weekly rent $375.	56	-
7	Couple with 2 children. One parent works full time, the other part time. The first has a high income ($50/hour) and the second earns the median wage. Weekly rent $560.	54	47
8	Single person, who works full time for a high wage ($50/hour). Weekly rent $375.	26	-

In most family scenarios, the replacement rates are above 50 percent of the families' net income prior to job losses. The highest replacement rate is for sole parent earning median wage rate where 79 percent of the net income from working is replaced by the net income obtained from the welfare system if the sole parent was made redundant. Generally, replacement rates are higher for those with children and for those earning low and median wage rates. This finding is not surprising given the emphasis in the New Zealand tax-transfer system towards targeting assistance by income and the ages and numbers of children. Families with children and lower wage families are the people most insulated from economic shocks.

This is the converse of the families facing relatively high effective marginal tax rates as a large change in their gross incomes translates into a small or no change in net incomes. Higher wage earners and people without children are mostly likely to face a large drop in income when their gross incomes fall. The replacement rate for a single person earning $50 per hour is 26 percent. In scenarios where both parents lose their jobs, the replacement rate for high income couples with dependent children is similar to couples earning median wages without children, which is about 47 percent.

4 Conclusions

This paper has examined the income-replacement rates, which is the loss of earnings being replaced by New Zealand social welfare for a selection of hypothetical individuals and families. Income replacement rates are useful to understand the level of income security provided by the government to displaced workers due to technological changes or economic disruptions. To fully capture the complexity of the tax and welfare system, the paper utilised the Treasury's microsimulation model, TAWA.

In most family scenarios, the replacement rates are above 50 percent of the families' net income prior to job losses. The highest replacement rate is for sole parent earning median wage rate where 79 percent of the net income from working is replaced by the net income obtained from the welfare system if the sole parent was made redundant. For a single person earning minimum wage, the replacement rate is 56 percent. Generally, replacement rates are higher for those with children and for those earning low and median wage rates. This finding is not surprising given the emphasis in the New Zealand tax-transfer system towards targeting assistance by income and the ages and numbers of children. Families with children and lower wage families are most insulated from economic shocks.

This is the converse of the families facing relatively high effective marginal tax rates as a large change in their gross incomes translates into a small or no change in net incomes. Higher wage earners and people without children are mostly likely to face a large drop in income when their gross incomes fall. The replacement rate for a single person earning $50 per hour is 26 percent. In scenarios where both parents lose their jobs, the replacement rate for high income couples with dependent children is similar to couples earning median wages without children, which is about 47 percent.

In comparison, the OECD average replacement rates for the unemployment insurance sit around 60 and 40 percent after 2 months and 1 year of unemployment, respectively. The replacement rates and the design of unemployment insurance scheme vary widely across countries. For a single individual who previously earned the average wage in Denmark, the payment is around 58 percent of his/her prior income. Payments are higher for individuals with dependent children and lower wage earners. Most workers in Canada receive around 55 percent of their prior earnings, up to an insurable income cap and for a certain amount of time.

There has been renewed interest in the idea of unemployment insurance as an alternative way of income smoothing. Private insurance companies and banks in New Zealand offer income protection insurance but are not widely sought by individuals to cover situations of job displacement. The presence of moral hazard and adverse selection have resulted in the failure of private redundancy insurance in the country. This failure is often a rationale for policy intervention to seek public solutions for the problem.

Both social assistance and social insurance systems smooth incomes but in different ways. A social assistance system provides a level of support below which families cannot fall, but which is not based on previous earnings or work history. Families are thus protected from "catastrophic" losses of income but for some higher income earners the fall in income can be large. In contrast, unemployment insurance systems provide assistance based on previous earnings or work history. To understand the merits and design of social unemployment insurance, it is useful to discuss the trade-offs, the distribution impact, fiscal costs and potential employment disincentive effects of the scheme. Further research on inefficiency and welfare cost created by adverse selection in the New Zealand insurance market are also useful to enhance the understanding of the scheme and some potential forms of public policy intervention.

References

Creedy, J., Mercante, J. and Mok, P. 2018, 'The labour market effects of "Working for Families" in New Zealand', The Australian Economic Review, 51(2): 211-231.

Creedy, J., and Mok, P. 2018, 'The marginal welfare cost of personal income taxation in New Zealand', New Zealand Economic Papers, 52(3), 323-338.

Einav, L. and Finkelstein, A, 2011, 'Selection in insurance markets: theory and empirics in pictures', Journal of Economic Perspectives, 25 (1): 115-138.

Fletcher, M, 2015, 'The structure and generosity of financial assistance for beneficiaries: How New Zealand compares with other OECD countries', Ministry of Social Development.

Mercante, J. and Mok, P., 2014a, 'Estimation of labour supply in New Zealand', New Zealand Treasury Working Paper no. 14/08.

Mercante, J. and Mok, P., 2014b, 'Estimation of wage equations for New Zealand', New Zealand Treasury Working Paper no. 14/09.

New Zealand Productivity Commission, 2019, 'Employment, labour markets and income: Technological change and the future of work', Draft report 2, Nov 2019.

Nolan, P. 2005, 'Targeting families' assistance: Evaluating family and employment tax credits in New Zealand's tax-benefit system', Victoria University of Wellington.

Nolan, P. 2018, 'Effective marginal tax rates: The New Zealand case', Tax and Transfer Policy Institute Working Paper 7/2018, New Zealand Productivity Commission Working Paper 2018/01.

Perry, B. 2019, 'Household incomes in New Zealand: Trends in indicators of inequality and hardship 1982 to 2018', Ministry of Social Development.

OECD, 2017, 'Back to work - New Zealand: Improving the re-employment prospects of displaced workers', Paris: OECD.

WEAG, 2019(a), 'The income support system', Welfare Expert Advisory Group.

WEAG, 2019(b), 'The take-up of income support: Analysis and options', Welfare Expert Advisory Group.