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NEW ZEALAND

SELECTED ISSUES

April 20, 2021

Approved By
**Asia and Pacific
Department**

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THE UNEVEN IMPACT OF THE PANDEMIC ON NEW ZEALAND'S LABOR MARKET¹

While the pandemic's impact on New Zealand's labor market has been relatively mild by international comparison, it has disproportionately affected the youth, female workers, and some ethnic groups. The pandemic could thus lead to scarring and aggravate already relatively high inequality. Strong labor market policy support, including training and hiring subsidies, is warranted to facilitate the reallocation of workers affected by the pandemic.

A. Introduction

1. The pandemic has had an uneven impact on New Zealand's labor market, calling for renewed policy efforts. Despite the severe initial lockdown, a proactive policy response, especially the large-scale job retention policy, helped cushion the impact of the pandemic on labor market outcomes. However, the COVID-19 shock has had an uneven impact on different groups of workers, with more severe effects on youth, female and low-skilled workers, along with some ethnic groups. Experience from past recessions suggests that poor labor market outcomes, especially for the youth, can have persistent effects leading to scarring. Furthermore, the larger impact on already disadvantaged groups is likely to aggravate inequality. Therefore, strong policy support is warranted.

2. This paper analyzes the impact of the pandemic on New Zealand's labor market and discusses policy options. Section B discusses the pre-COVID landscape of New Zealand's labor market and inequality. Section C analyzes the labor market developments since the onset of the pandemic, delving into labor market indicators of different worker groups. Section D considers the possible scarring effects of the pandemic by drawing on cross-country labor market data. Section E analyzes the effectiveness of labor market policies to address emerging labor market issues, utilizing a cross-country dataset of labor market policies. Section F discusses policy options for New Zealand. Section G concludes by distilling policy implications from the paper's findings.

B. Labor Market and Inequality Before the Pandemic

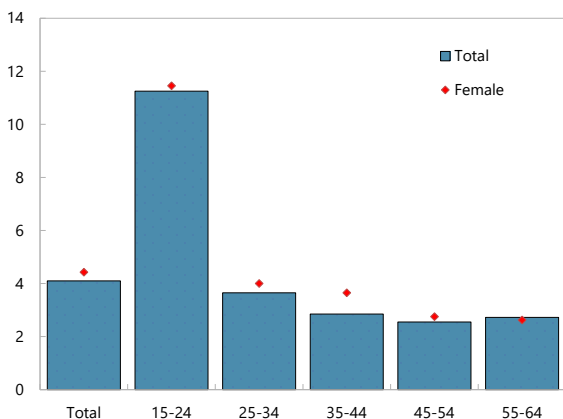
3. Despite relatively low unemployment before the pandemic, there was significant dispersion, with higher unemployment in some groups. Following a persistent increase after the global financial crisis, the unemployment rate decreased gradually to 4.1 percent in 2019. However, the youth unemployment rate was relatively high even before the pandemic, standing at 11.3 percent in 2019, similar to the OECD average, but higher than the average of major advanced economies (G7 average: 9.4 percent). Female unemployment was higher than male unemployment in most age groups, with a relatively large gap in the age group of 35-44.

¹ Prepared by Yosuke Kido and Siddharth Kothari (both APD). The chapter benefited from valuable comments by the Treasury of New Zealand, the Ministry of Business, Innovation and Employment (MBIE), the Ministry of Social Development (MSD), and participants at a virtual seminar.

4. Some ethnic groups faced higher unemployment. Historically, there has been large dispersion of labor market conditions between ethnic groups, with high unemployment rates among Māori and Pacific people, while their labor force participation rates have been lower. Such dispersion is observed in all age groups, suggesting that factors other than mere age distribution play a role. In part due to the dispersion in labor market outcomes across groups, inequality in New Zealand was relatively high compared to other advanced economies.

Youth and Female Unemployment Rates Are Higher

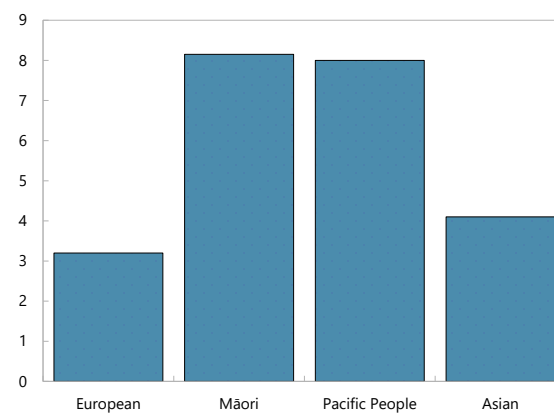
(Unemployment rate by age and gender, 2019, percent)



Sources: Stats NZ and IMF staff calculations.

Large Dispersion Among Ethnic Groups

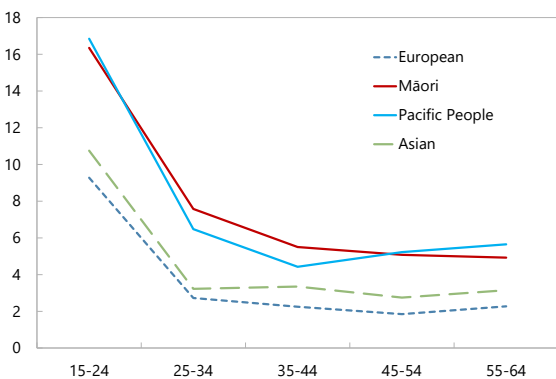
(Unemployment rate by ethnicity, 2019, percent)



Sources: Stats NZ and IMF staff calculations.

Gaps Among Ethnic Groups Are Observed in All Age Groups

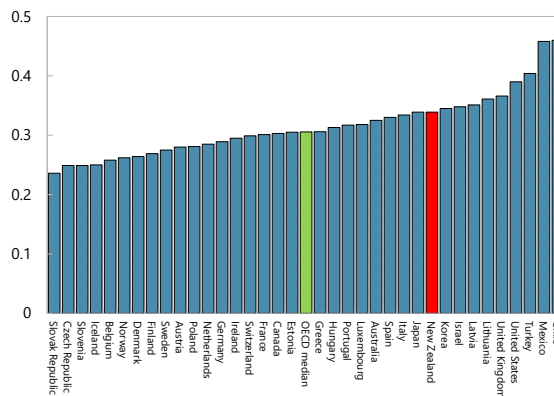
(Unemployment rate by age and ethnicity, 2019, percent)



Sources: Stats NZ and IMF staff calculations.

Inequality in New Zealand Was Relatively High Before the Pandemic

(Gini coefficient, latest, 2017-19)



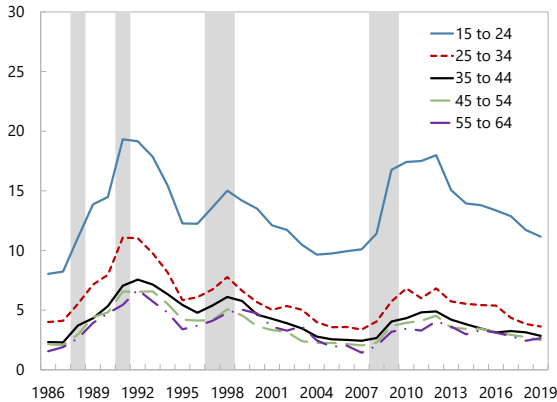
Sources: OECD and IMF staff calculations.

5. In previous recessions, young workers and low-skilled workers were affected more strongly. Output fluctuations affect unemployment differently across worker groups. Estimates of Okun’s law, the relationship between changes in unemployment and output growth, suggest that the unemployment rate among youth in New Zealand is more sensitive to economic cycles than that

among other age groups, with the sensitivity nearly twice as large as the average of all age groups. Similarly, low-skilled workers are also more prone to lose their jobs during economic downturns. Employment of female workers, on average, tended to be less sensitive to macroeconomic conditions in previous business cycles, as they have higher representation in typically less procyclical service sectors.²

Youth Unemployment Tends to Increase More Sharply During Downturns

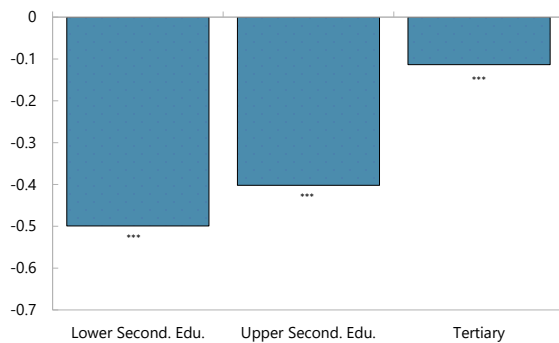
(Unemployment rates by age group, percent)



Sources: Stats NZ and IMF staff calculations.
 Note: Shaded area indicates New Zealand recessions defined by Hall (2014).

Low-Skilled Workers Tend to be Affected by Economic Fluctuations

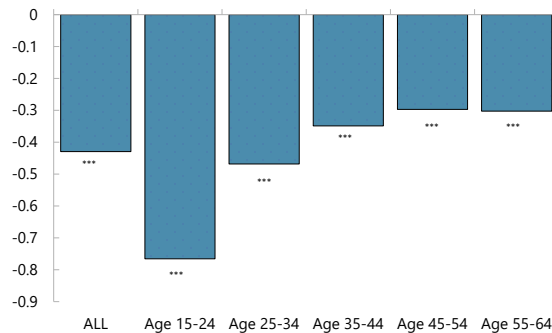
(Okun's law coefficient)



Source: IMF staff calculations
 Note: Bars show the sensitivity of the unemployment rate to GDP growth. See Annex I for methodology.
 *** denotes significance at the 1 percent level.

Young Workers Are More Sensitive to Economic Cycles

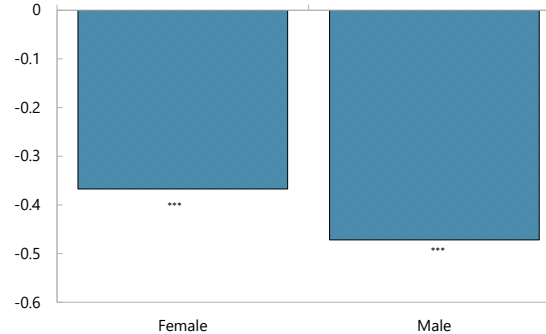
(Okun's law coefficient)



Source: IMF staff calculations.
 Note: Bars show the sensitivity of the unemployment rate to GDP growth. See Appendix I for methodology.
 *** denotes significance at the 1 percent level.

Female Employment Tended to be Less Procyclical in Previous Business Cycles

(Okun's law coefficient)

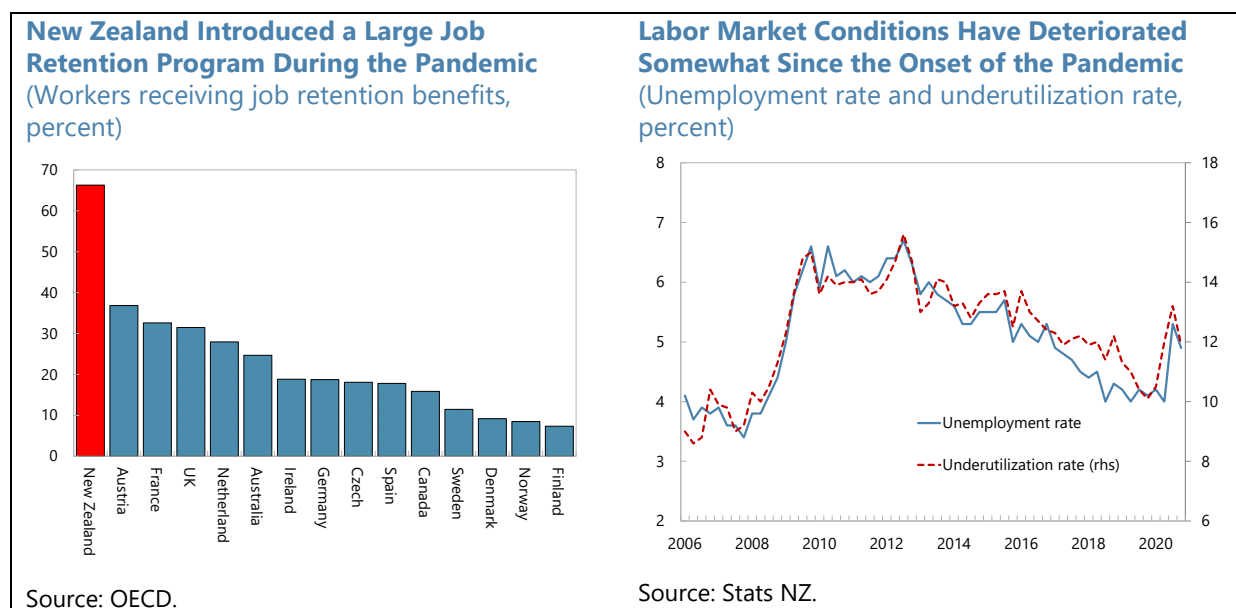


Source: IMF staff calculations.
 Note: Bars show the sensitivity of the unemployment rate to GDP growth. See Annex I for methodology.
 *** denotes significance at the 1 percent level.

² Similar difference by gender is also observed in other countries (Zanin 2014).

C. Impact of the Pandemic on New Zealand's Labor Market

6. The pandemic's labor market impact has been relatively contained. New Zealand introduced a strict lockdown and border closure in March 2020. Hours worked declined by close to 9 percent in 2020Q2 before recovering in Q3. To alleviate the impact of the pandemic and the containment measures, the government introduced a wage subsidy scheme covering more than 60 percent of workers, the widest coverage among such schemes in the world.³ As a result, the impact on labor market aggregates has been relatively small so far. The aggregate unemployment rate increased modestly to 4.9 percent in 2020Q4 from 4.1 percent in 2019Q4, while the underutilization rate increased more sharply from 10.1 percent in 2019Q4 to 11.9 percent in 2020Q4.



7. Job losses have been concentrated in contact-dependent service sectors. Labor market adjustment has been uneven across sectors, and job losses have been concentrated in some service sectors dependent on tourism, such as accommodation, food services, and recreational services. The adjustment is different from previous recessions, where manufacturing and constructions were affected more severely.

8. The impact of the pandemic has been uneven, with a more severe impact on youth, female, and low-skilled workers.⁴ Youth employment has seen the largest adjustment, with a 2.4 percentage point y/y increase in the unemployment rate. Furthermore, as job losses have been concentrated in contact-intensive service sectors, this has resulted in a larger increase in female unemployment and underutilization. By ethnicity, as pointed out in the Budget Policy Statement

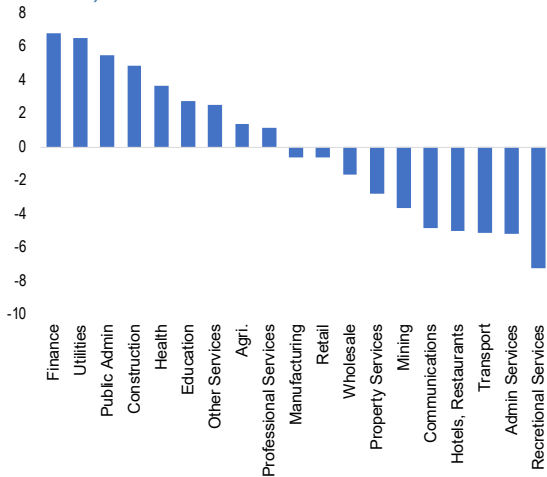
³ See OECD (2020) for detail of other countries' schemes and IMF Policy Tracker (<https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>) for fiscal costs of these responses. Wage subsidies in New Zealand expired in October 2020, and subsidies are expected to be re-instated contingent on COVID-19 resurgence.

⁴ Similar uneven effects of the pandemic are observed in many other economies. See IMF (2020) and references therein for detail.

2021, Māori and Pacific people have been more affected than other ethnic groups.⁵ Workers with lower levels of education also appear to be more severely impacted compared with those with higher levels of education.

Job Losses are Concentrated in Some Service Sectors

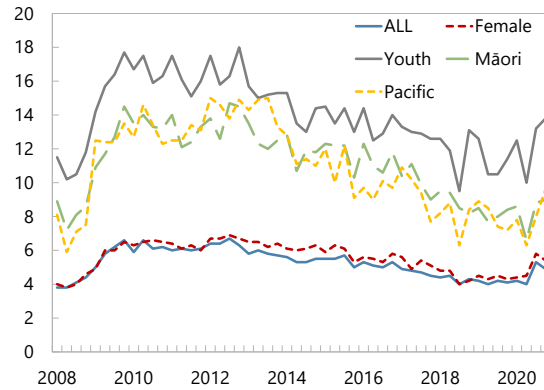
(Employment by industry, y/y percent change, in Dec. 2020)



Sources: Stats NZ and IMF staff calculations.
Note: Employment growth rates calculated from tax data released by Stats NZ.

Labor Market Adjustment Has Been Uneven Among Worker Groups

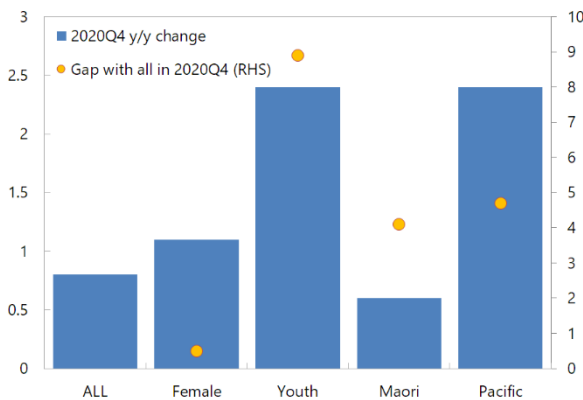
(Unemployment rate, percent)



Source: Stats NZ.
Note: Unemployment rates for all workers and female workers are seasonality adjusted.

Some Worker Groups Have Been Affected More Severely

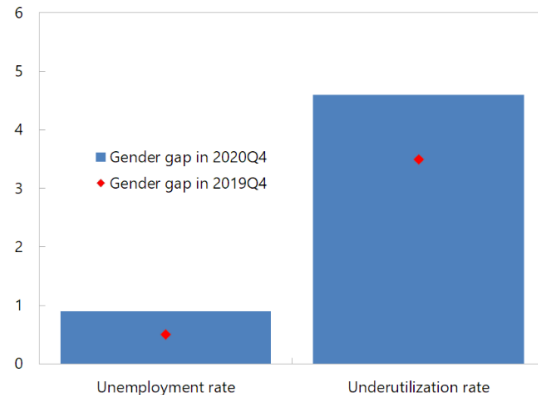
(Unemployment rate, percentage points)



Sources: Stats NZ and IMF staff calculations.

The Gender Gap Has Widened

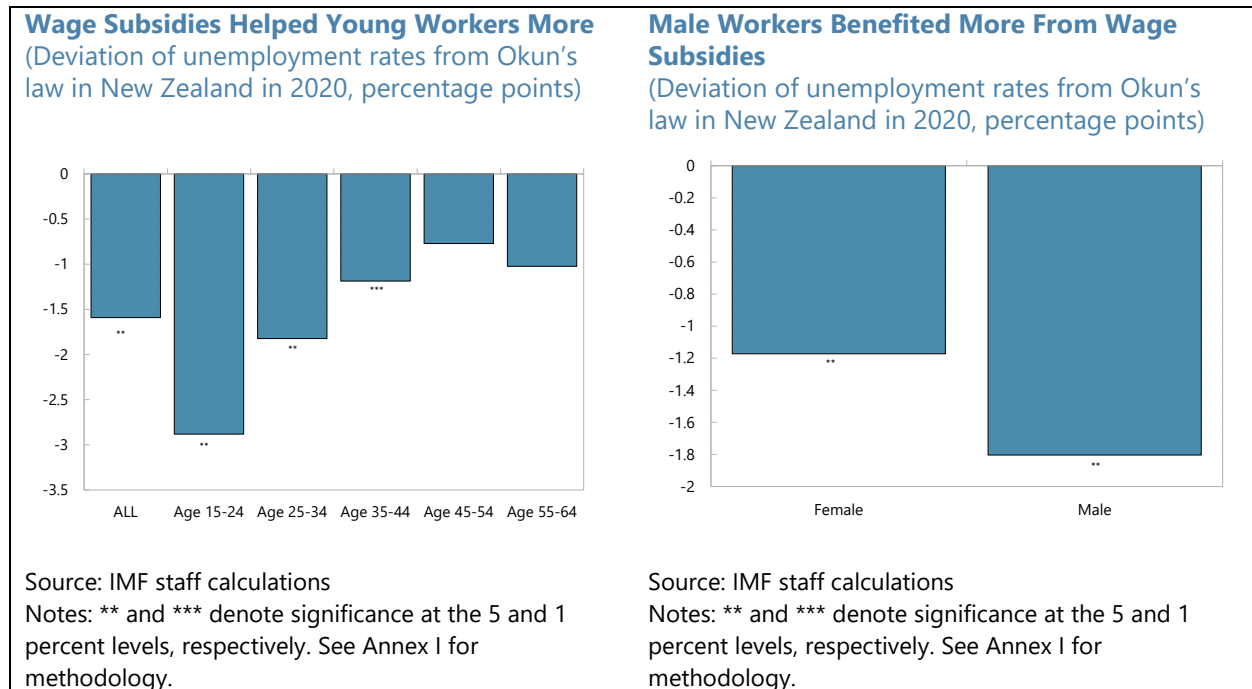
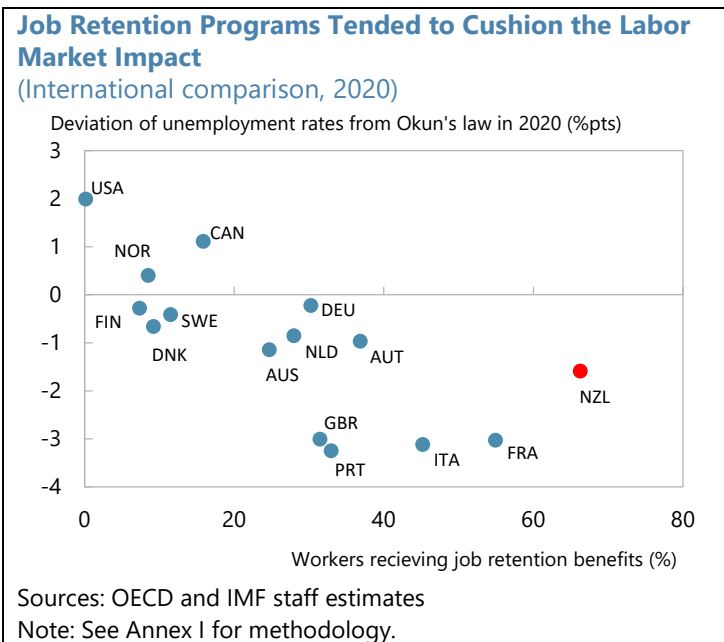
(Female minus male, ppts)



Sources: Stats NZ and IMF staff calculations.

⁵ Based on the analysis by New Zealand Treasury, Budget Policy Statement 2021 pointed out that Māori and Pacific workers were more likely to have dropped into a low-income bracket (of between NZ\$200 and NZ\$300 per week) from March to August 2020. Māori indicators in Household Labour Force Survey have been volatile. The employment rate declined sharply in 2020Q3 but recovered in 2020Q4. A gap with overall workers remains high. The unemployment rate of Asian workers has increased more sharply than the aggregate after the pandemic, although it remains well below unemployment rates of Māori and Pacific people.

9. The wage subsidy program has played an important role in cushioning the labor market impact of the crisis. International comparison suggests that countries with larger coverage of job retention programs tended to have more benign labor market outcomes compared to predictions based on Okun’s law, the historical relationship between output and the unemployment rate (see Annex I for details).⁶ In New Zealand, especially the youth unemployment rate increased by less than predicted based on historical Okun’s law estimates, suggesting that wage subsidies (and the broader policy response) were particularly effective in cushioning the impact on young workers. Furthermore, while helpful for female workers, male workers tended to benefit more. These observations are consistent with the Ministry of Social Development (MSD) administrative data, which shows that the proportion of young workers and male workers that received wage subsidies was higher than that of other groups.



⁶ For the international comparison, in addition to the coverage of job retention schemes, the duration of the schemes may affect the impact of the job retention policies as well.

D. Scarring Effects

10. Although the economy has embarked on a quick recovery, concerns about the potential for labor-market scarring remain. Labor market conditions at the time when people graduate from school can have significant effects on medium-term outcomes (see Cockx, 2016, for an overview). As youth unemployment has seen a significant spike following the COVID-19 shock, this raises the possibility that unemployment rates may remain high for an extended period for the cohort that is entering the labor market at this time.

11. In this section, cross-country data is used to conduct cohort analysis to assess the possible magnitude of scarring in the labor market. The empirical framework is that of Kawaguchi and Murao (2014), which assesses the extent to which higher unemployment rates faced by a cohort in their youth translates into higher unemployment rates for the same cohort in later years. The regression equation takes the form:

$$u_{cit} = \alpha + \beta * u_{youth,ci} * ageGrp_{ct} + \gamma * ageGrp_{ct} + \delta_{it} + \epsilon_{cit}$$

Where u_{cit} is the unemployment rate of cohort 'c' in country 'i' at time 't', $u_{youth,ci}$ is the unemployment rate faced by the cohort in their youth (15 to 24 years of age), and $ageGrp_{ct}$ is a vector of dummies which takes value 1 for ages corresponding to the groups 25–29, 30–34, 35–39, and 40–44. The vector of coefficients β indicates the extent to which higher youth unemployment for a cohort translates into higher unemployment at different ages in the future. δ_{it} controls for country-year shocks which impact all cohort/age groups equally (e.g. a recession which pushes up unemployment rate for all cohorts in a country) and standard errors are clustered at the country level. Unemployment rates by age group (five-year intervals) from the OECD for 30 countries from the period 1960 to 2019 are used to construct the dataset at the country-cohort-year level.

12. The results confirm that high youth unemployment can have persistent effects. A cohort which experiences a 1 percentage point higher unemployment rate during its youth also suffers from about a 0.2 percentage point higher unemployment rate when they are 25 to 29 years of age, and about 0.05 percentage point higher (+0.208-0.150) unemployment rate when they are 30 to 34 years of age. Beyond age 35, the effect of youth unemployment becomes insignificant.

13. The extent of scarring is larger for women and for countries with less flexible labor markets. Columns 2 and 3 of Table 1 repeat the regression for males and females separately. High youth unemployment translates to unemployment rates at 25 to 29 years of age being 0.21 percentage point higher for women, slightly more than the estimated 0.19 percentage point for men. Importantly, while women continue to have higher unemployment at age 30 to 34, the effect becomes insignificant for men at this age. Finally, column 4 adds an interaction term with a country-level measure of employment protection restrictions to the regression, which Kawaguchi and Murao (2014) used as a proxy for flexibility of labor markets. As expected, persistent effects of youth unemployment are larger for countries with more restrictive employment protections. This indicates that countries with more flexible labor markets are likely to experience less scarring from high youth

unemployment.⁷ Conditional on the level of New Zealand's (relatively mild) employment protections, the average increase of New Zealand's youth unemployment rate in previous recessions (8-9 percentage points) translates to about a 0.4-0.5 percentage point higher unemployment rate at ages 25 to 29, compared to an impact of about 2.5 percentage points in a country with the average level of employment protections.

Table 1. New Zealand: Cross-Country Evidence: Impact of Youth Unemployment on Future Unemployment Rates

VARIABLES	(1) All	(2) Male	(3) Female	(4) EPL Interaction
Youth unemployment	0.208*** (0.0414)	0.185*** (0.0463)	0.212*** (0.0319)	0.132*** (0.0381)
Reference age group: 25 to 29				
Youth unemployment*Age dummy for 30 to 34	-0.150*** (0.0295)	-0.143*** (0.0299)	-0.142*** (0.0255)	-0.106*** (0.0174)
Youth unemployment*Age dummy for 35 to 39	-0.212*** (0.0455)	-0.197*** (0.0467)	-0.199*** (0.0401)	-0.139*** (0.0245)
Youth unemployment*Age dummy for 40 to 44	-0.246*** (0.0550)	-0.227*** (0.0547)	-0.229*** (0.0509)	-0.160*** (0.0273)
Youth unemployment*EPL				0.156** (0.0597)
Reference age group: 25 to 29				
Youth unemployment*EPL*Age dummy for 30 to 34				-0.120** (0.0465)
Youth unemployment*EPL*Age dummy for 35 to 39				-0.208*** (0.0632)
Youth unemployment*EPL*Age dummy for 40 to 44				-0.257*** (0.0693)
Constant	6.139*** (0.587)	6.181*** (0.633)	6.501*** (0.476)	7.152*** (0.587)
Observations	14,379	14,379	14,379	14,379
R-squared	0.961	0.945	0.967	0.968

Notes: Data on unemployment rate at the country-cohort-age level from OECD. EPL stands for Employment Protection Legislation Index also sourced from OECD. Sample consists of 30 countries from 1960 to 2019.

E. Active Labor Market Policies

14. The literature generally points to the effectiveness of active labor market policies in fostering employability. At the aggregate level, with OECD cross-country samples, Bassanini and Duval (2006) find that some types of active labor market policies, such as training, are associated with lower unemployment. With samples from selected advanced economies, Estevao (2003, 2007) finds positive effects of active labor market policies on the employment rate of the business sector. Micro-level evidence often finds heterogenous effects among different groups of workers, suggesting that the design, targeting, and implementation of a policy are paramount in ensuring its

⁷ Results are qualitatively similar if we look at the impact on employment rates instead of unemployment rates. In particular, lower youth employment rates are associated with lower employment rates at older ages, with the effect being somewhat larger for women (see Annex II, Table 1).

effectiveness. With a meta-analysis of over 200 micro-level studies of active labor market policies in advanced and emerging economies, Card and others (2018) find that active labor market policies, such as training and private sector employment subsidy programs, have been generally effective, especially in the medium- to long-term, and their effects tend to increase in recessions. Direct job creation is often found to be less effective compared to training and hiring subsidies (Kleuv 2010).

15. In this section, a cross-country dataset of active labor market policies is used to analyze the effectiveness of active labor market policies. The effectiveness of active labor market policies in improving labor market conditions can be quantified by examining the experience of different advanced economies that have had a variety of labor market policies over multiple years. This section uses cross-country panel data of OECD countries, which includes labor market indicators and key policy variables. The empirical framework is based on the standard Okun’s law model, augmented with active labor market policies. The regression equation takes the form

$$\Delta u_{i,t} = \alpha_t + \alpha_i + \sum_{j=1}^n \beta_j \Delta ALMP_{i,j,t-1} + \gamma_1 * \Delta \ln(GDP_{i,t}) + \gamma_2 * \Delta \ln(GDP_{i,t-1}) + \epsilon_{i,t}$$

where $\Delta u_{i,t}$ denotes a change in the unemployment rate of country i at time t , and $\Delta ALMP_{i,j,t}$ denotes a change in the spending in percent of GDP on active labor market policy j . In this exercise, we include three types of active labor market policies: training; employment incentives (e.g. recruitment incentives and employment maintenance incentives); and other policies, which include direct job creation, start-up incentives, and rehabilitation.⁸ In the regression, the average of previous two years is used as active labor market policies typically impact outcomes with lags (e.g. Card and others 2018). $\Delta \ln(GDP_{i,t})$ denotes GDP growth rate. The panel dataset covers OECD economies from 1994 to 2019. We run this regression for the overall, female, and youth unemployment rates.

Table 2. New Zealand: Effects of Active Labor Market Policies

	ALL	Female	Young
Training (lagged)	-0.68 (0.86)	-0.65 (1)	-3.61* (2.07)
Employment Incentives (lagged)	-2.59** (0.99)	-3.02* (1.71)	-5.03** (2.1)
Other ALMP (lagged)	0.47 (1.16)	-0.21 (1.32)	-0.16 (2.46)
GDP growth	-0.22*** (0.04)	-0.19*** (0.04)	-0.42*** (0.11)
GDP growth (lagged)	-0.11*** (0.02)	-0.11*** (0.02)	-0.22*** (0.03)
Country FE	Y	Y	Y
Time FE	Y	Y	Y
Observations	545	545	545
Sample Period	1994-2019	1994-2019	1994-2019

Source: IMF staff estimates.

Notes: The dependent variable is a change in unemployment rate. Clustered robust standard errors are estimated.

⁸ Spending on public employment services (e.g. cost of running unemployment insurance offices) is excluded from this exercise to alleviate endogeneity concerns.

16. The cross-country estimation results generally support the effectiveness of active labor market policies. Estimation results show that employment incentives are particularly effective for the overall population.⁹ Subgroup analysis suggests that training programs are particularly effective for young people, which tend to have weaker occupational skills, suggesting that appropriate targeting is essential to improve the effectiveness of labor market policies. Employment incentives tend to be more effective for female workers. Other active labor market policies, such as direct job creation, are not found to be effective for all types of workers.¹⁰

17. The design and targeting of schemes matter to maximize the effectiveness of active labor market policies. Micro-level evidence often suggests that training is particularly effective for low-skilled workers and for reducing long-term unemployment (e.g. Card and others, 2018). Some literature argues that specific skill training tends to have larger effects compared to general training (e.g. Greenberg and others, 2003 and Jacobson et al, 2005) and that training can be particularly effective when combined with job search assistance (Dorsett 2006). Hiring subsidies would have a larger impact on employment if targeted at small firms, low-wage workers, and jobs with rigid wages, and would be more cost-effective if they are used temporarily during recessions (Cahuc, 2019).

F. Policy Options to Address Emerging Labor Market Issues and Inequalities in New Zealand

18. New Zealand can further increase its spending to address emerging labor market issues and growing inequalities. Spending on active labor market policies in New Zealand has been relatively low and was on a declining trend before the pandemic.¹¹ Public spending on active labor market policies has been reduced to 0.2 percent of GDP in 2017 from 0.5 percent in 2004, with a marked decline in spending on training (Welfare Expert Advisory Group, 2018). Like in some other advanced economies, active labor market policies were not deployed actively during the global financial crisis. Since the onset of the pandemic, New Zealand has expanded active labor market policies, including direct job creation, hiring subsidies, and free access to training (see Table 3), in addition to the large-scale wage subsidy scheme that was central in supporting workers affected by the pandemic. Going forward, more can be done in some areas to foster employability and promote human capital accumulation.

⁹ Using a meta analysis of European labor markets, Kluve (2010) finds that private sector incentive schemes, such as hiring subsidies, tend to have a larger impact on employment compared to training.

¹⁰ Results are robust to adding a lagged change in the spending on passive labor market policies.

¹¹ It should be noted that gap with other countries will be smaller after the size of unemployment is controlled for. The data (*Public expenditure and participation stock on LMP*, obtained from OECD.stat) do not include broader support measures, such as education spending and childcare.

Table 3. New Zealand: Labor Market Policies and Income Support Measures Introduced After the Pandemic

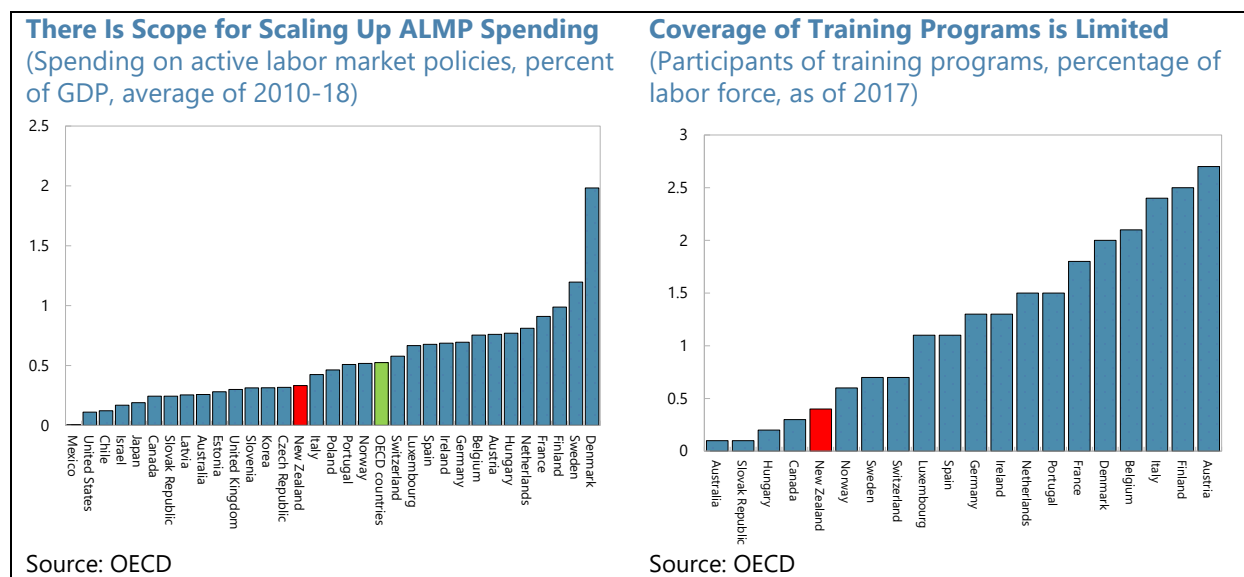
- Wage subsidies (NZ\$ 14.8 bn)
- Permanent increase in social benefits (NZ\$ 2.4 bn)
- COVID-19 leave and self-isolation support (NZ\$ 0.1 bn)
- Income Relief Payment (NZ\$ 0.6 bn)
- Increase in Winter Energy Payment (NZ\$ 0.5 bn)
- Job creation in environmental projects (NZ\$ 1.1 bn)
- Targeted Training and Apprenticeship Fund (NZ\$ 0.3 bn)
- MSD capacity expansion (NZ\$ 0.4 bn)
- Expansion of Flexi-Wage Subsidies (NZ\$ 0.3 bn)
- He Poutama Rangatahi – youth employment support (NZ\$ 0.1 bn)

Source: New Zealand authorities.

19. New Zealand can step up support for displaced workers and alleviate skill mismatches in the labor market. In New Zealand, training schemes cover only a limited part of the labor force.¹² The coverage of training programs can be expanded to support broader workers in transition, in particular low-skilled workers and long-term unemployed individuals. Training programs should also be upgraded to reflect needs from industry, and the ongoing Reform of Vocational Education (RoVE) is a step in the right direction and should enhance effectiveness of training programs. The recent expansion of Flexi-Wage subsidies (hiring subsidies) is a welcome development, and support targeted at displaced low-wage workers can be scaled up if long-term unemployment persists. Strong job search assistance would also facilitate reallocation of workers at relatively low fiscal costs. In addition to scaling up policies, it will also be important to review and reinforce the quality of interventions. While training and hiring subsidies are assessed to be effective, other programs may have some room for improvement (MSD 2019). More generally, as the employment likelihood decreases with duration of the unemployment spell, early activation is crucial to limit scarring in the labor market and promote long-term human capital accumulation.

20. Policies should also address inequality and the gender gap. There are large disparities in education achievement in New Zealand, with Māori and Pacific People's education achievement remaining below the rest of the population. Targeted education support for these groups would promote human capital accumulation and reduce inequality in the longer run. Expanding childcare support would promote labor force participation of female workers and would help close the gender gap, which has deteriorated after the pandemic.

¹² Training programs in New Zealand are narrowly targeted to those who are receiving benefits (e.g. Jobseeker Support).



G. Conclusion

21. The pandemic has had a relatively mild yet uneven impact on New Zealand's labor market, aggravating pre-existing disparities in labor market outcomes. Even before the COVID-19 shock, unemployment was significantly higher among the youth, women, low-skilled workers, and particular ethnic groups (Māori and Pacific peoples). The large-scale wage subsidy program has mitigated the impact of the crisis on labor market outcomes. However, the groups with worse outcomes before the crisis have generally also suffered relatively more during the pandemic, especially youth who have seen the largest drop in employment.

22. The relatively large impact of the crisis on youth and women raises concerns about the potential for labor market scarring. Our cross-country estimates based on cohort analysis suggest that a 1 percentage point increase in youth (between 15 and 24 years of age) unemployment is associated with a 0.2 percentage point higher unemployment rate between the ages of 25 and 29. Furthermore, the scarring effects are larger and more persistent for women.

23. Continued macroeconomic policy support and active labor market policies can help mitigate the distributional effects of the crisis and reduce scarring. Active labor market policies, such as training, especially for young workers, and hiring subsidies would facilitate reallocation of workers affected by the pandemic, thereby limiting the scarring. Spending on active labor market policies in New Zealand has been relatively low, suggesting that there is scope for scaling up policy support. New Zealand can upgrade training programs and expand their coverage to broader workers, including low-skilled people. Hiring subsidies targeted to low-wage workers would foster employability in New Zealand. Strong policy actions would also promote long-term human capital accumulation and reduce growing inequality.

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Annex I. Okun's Law Equations

Okun's law regressions are estimated to analyze the sensitivity of the unemployment rates of different worker groups to macroeconomic conditions. Specifically, the following regression is estimated:

$$\Delta u_t = \alpha + \beta_1 * \Delta \ln(GDP_t) + \beta_2 * \Delta \ln(GDP_{t-1}) + \gamma * Dummy_{2020} + \epsilon_t,$$

where Δu_t denotes a change in the unemployment rate at time t of different groups, $\Delta \ln(GDP_t)$ denotes GDP growth rate, and $Dummy_{2020}$ denotes a dummy variable that takes 1 in 2020, which is included to control for policy effects, including wage subsidies.¹ Parameters are estimated at the annual frequency. For comparison, regression without the dummy variable is also estimated. Tables I.1 and I.2 report estimated parameters for different worker groups in New Zealand and Table I.3 shows the international comparison.

The charts in Section B report estimated sensitivities of the unemployment rate to GDP growth ($\beta_1 + \beta_2$) from these tables. Section C reports the estimated coefficients of the dummy variable (γ) for different worker groups, as well as the international comparison. This coefficient reflects the extent to which unemployment in 2020 deviated from the historical relation between output and unemployment, capturing the impact of the policy response, especially job retention schemes, in cushioning the labor market impact of the pandemic. Figure I.1 shows actual and predicted values of the unemployment rate for selected worker groups.

Table I.1. New Zealand: Okun's Law Equations by Age Groups

	ALL	Age 15-24	Age 25-34	Age 35-44	Age 45-44	Age 54-64	ALL	Age 15-24	Age 25-34	Age 35-44	Age 45-44	Age 54-64
GDP growth	-0.377*** (0.058)	-0.7*** (0.134)	-0.419*** (0.083)	-0.279*** (0.036)	-0.227*** (0.048)	-0.215*** (0.063)	-0.288*** (0.053)	-0.538*** (0.118)	-0.317*** (0.073)	-0.212*** (0.035)	-0.184*** (0.04)	-0.157*** (0.053)
GDP growth (lagged)	-0.052 (0.057)	-0.066 (0.13)	-0.049 (0.08)	-0.07* (0.035)	-0.07 (0.046)	-0.088 (0.061)	-0.098 (0.06)	-0.15 (0.132)	-0.102 (0.082)	-0.104** (0.039)	-0.092* (0.045)	-0.118* (0.06)
Dummy_2020	-1.591** (0.583)	-2.882** (1.341)	-1.823** (0.828)	-1.187*** (0.361)	-0.772 (0.476)	-1.024 (0.628)	- -	- -	- -	- -	- -	- -
Constant	1.072*** (0.17)	2.017*** (0.39)	1.17*** (0.241)	0.909*** (0.105)	0.75*** (0.139)	0.784*** (0.183)	0.915*** (0.177)	1.734*** (0.39)	0.99*** (0.242)	0.792*** (0.115)	0.674*** (0.134)	0.683*** (0.177)
Adj R-squared	0.70	0.59	0.58	0.80	0.62	0.46	0.64	0.54	0.52	0.73	0.59	0.43
Sample Period	1990-2020	1990-2020	1990-2020	1990-2020	1990-2020	1990-2020	1990-2020	1990-2020	1990-2020	1990-2020	1990-2020	1990-2020

Source: IMF staff estimates.

Table I.2. New Zealand: Okun's Law Equations by Gender and Education Groups

	Female	Male	Female	Male	Lower Second.	Upper Second.	Tertiary
GDP growth	-0.319*** (0.056)	-0.417*** (0.067)	-0.254*** (0.049)	-0.315*** (0.061)	-0.5*** (0.079)	-0.344*** (0.073)	-0.138*** (0.049)
GDP growth (lagged)	-0.048 (0.055)	-0.055 (0.065)	-0.082 (0.055)	-0.108 (0.069)	0.0004 (0.076)	-0.058 (0.07)	0.024 (0.047)
Dummy_2020	-1.172** (0.565)	-1.804** (0.674)	- -	- -	- -	- -	- -
Constant	0.918*** (0.164)	1.172*** (0.196)	0.802*** (0.164)	0.994*** (0.204)	1.301*** (0.24)	1.07*** (0.221)	0.249 (0.148)
Adj R-squared	0.65	0.68	0.61	0.61	0.66	0.57	0.21
Sample Period	1990-2020	1990-2020	1990-2020	1990-2020	1991-2019	1991-2019	1991-2019

Source: IMF staff estimates.

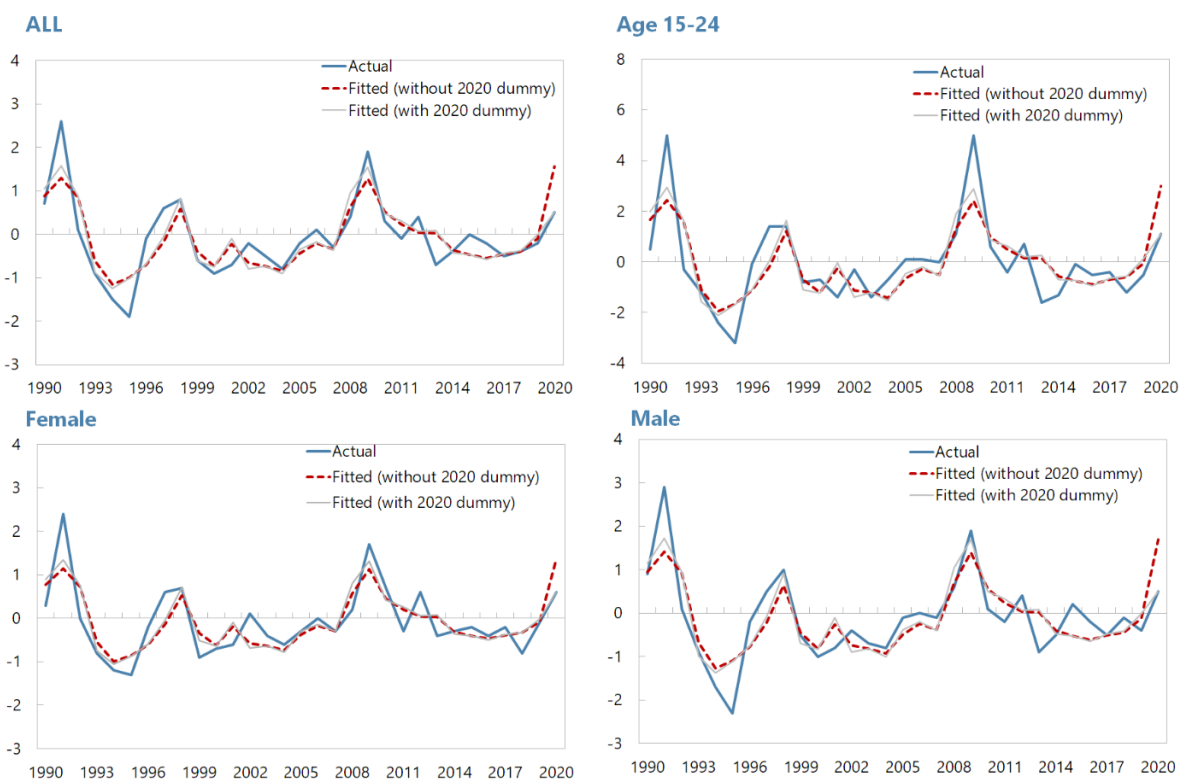
¹ Of course, to the extent that the policy response also mitigated the decline in GDP, the overall effect of policies on the unemployment rate is likely larger. It should also be noted that the dummy variable may capture other factors, including structural changes and possible measurement errors during the lockdown.

Table I.3. New Zealand: Okun's Law Equations for Selected Advanced Economies

	NZL	AUT	AUS	CAN	DEU	DNK	FIN	FRA	GBR	ITA	NLD	NOR	PRT	SWE	USA
GDP growth	-0.377*** (0.058)	-0.203*** (0.051)	-0.425*** (0.075)	-0.36*** (0.039)	-0.196*** (0.067)	-0.335*** (0.048)	-0.257*** (0.056)	-0.252*** (0.059)	-0.306*** (0.055)	-0.223*** (0.063)	-0.216*** (0.066)	-0.13* (0.069)	-0.413*** (0.115)	-0.318*** (0.05)	-0.41*** (0.084)
GDP growth (lagged)	-0.052 (0.057)	-0.006 (0.051)	-0.212*** (0.073)	-0.058 (0.039)	-0.055 (0.061)	-0.122** (0.049)	-0.221*** (0.055)	-0.119** (0.055)	-0.097* (0.055)	-0.137** (0.061)	-0.166** (0.065)	-0.055 (0.069)	-0.013 (0.114)	-0.208*** (0.05)	-0.089 (0.083)
Dummy_2020	-1.591** (0.583)	-0.965 (0.589)	-1.143* (0.607)	1.115** (0.457)	-0.223 (0.814)	-0.661 (0.519)	-0.278 (0.97)	-3.028*** (0.726)	-3.006*** (0.805)	-3.117*** (0.855)	-0.85 (0.679)	0.402 (0.503)	-3.248** (1.525)	-0.413 (0.658)	1.995** (0.807)
Constant	1.072*** (0.17)	0.371** (0.14)	1.86*** (0.27)	0.857*** (0.115)	0.261 (0.181)	0.676*** (0.135)	0.927*** (0.196)	0.597*** (0.132)	0.673*** (0.14)	0.282** (0.119)	0.703*** (0.173)	0.376** (0.166)	0.5* (0.249)	1.282*** (0.172)	1.166*** (0.252)
Adj R-squared	0.70	0.44	0.68	0.89	0.25	0.72	0.67	0.54	0.64	0.45	0.51	0.25	0.44	0.71	0.73
Sample Period	1990-2020	1997-2020	1988-2020	1990-2020	1992-2020	1993-2020	1989-2020	1990-2020	1990-2020	1990-2020	1990-2020	1990-2020	1997-2020	1990-2020	1990-2020

Source: IMF staff estimates.

Figure I.1. Actual and Fitted Unemployment Rates (Changes in Unemployment Rates, pts)



Note: Fitted values are based on Okun's law equations reported in Appendix Table 1 and 2 (with and without 2020 dummies). Sources: IMF staff estimates.

Annex II. Additional Results on Impact of Youth Unemployment on Future Unemployment Rates

VARIABLES	(1) All	(2) Male	(3) Female	(4) EPL Interaction
Youth employment rate	0.170** (0.0705)	0.169*** (0.0513)	0.195* (0.111)	0.0927 (0.0820)
Reference age group: 25 to 29				
Youth employment*Age dummy for 30 to 34	-0.0920** (0.0398)	-0.142*** (0.0491)	-0.0614 (0.0444)	-0.0556 (0.0350)
Youth employment*Age dummy for 35 to 39	-0.133** (0.0519)	-0.191*** (0.0664)	-0.0872 (0.0565)	-0.0868* (0.0465)
Youth employment*Age dummy for 40 to 44	-0.144** (0.0554)	-0.220*** (0.0768)	-0.0598 (0.0633)	-0.106* (0.0540)
Youth employment*EPL				0.131 (0.105)
Reference age group: 25 to 29				
Youth employment*EPL*Age dummy for 30 to 34				-0.0923* (0.0511)
Youth employment*EPL*Age dummy for 35 to 39				-0.155** (0.0598)
Youth employment*EPL*Age dummy for 40 to 44				-0.185** (0.0683)
Constant	66.57*** (3.138)	73.60*** (2.656)	58.47*** (4.674)	70.81*** (3.768)
Observations	14,406	14,406	14,406	14,406
R-squared	0.940	0.930	0.932	0.948

Notes: Data on employment rate at the country-cohort-age level from OECD. EPL stands for Employment Protection Legislation Index also sourced from OECD. Sample consists of 30 countries from 1960 to 2019.

THE PANDEMIC'S IMPACT ON NEW ZEALAND'S HOUSEHOLD AND NON-FINANCIAL CORPORATE BALANCE SHEETS¹

A. Introduction

1. New Zealand's households and corporates have so far weathered the impact of the COVID-19 shock relatively well. Relative strength of the balance sheets at the outset, strong cash flow support from expansionary fiscal and monetary policies, and loan deferrals from sound and well-capitalized banks have cushioned households and the corporate sector from the initial brunt of adverse impact.

2. There are, however, inherent vulnerabilities, and the repercussions from the pandemic may heighten some of them. While New Zealand's corporate debt is relatively low internationally and was falling in the period pre-COVID, there are some vulnerabilities, especially in the hospitality and transportation sectors that are hard-hit by the closure of the international border. While households have weathered the COVID-19 shock relatively well to date, rising housing costs increasingly affect affordability for some segments of society. Moreover, household debt is relatively high among advanced economies, which, together with banks' concentrated exposure to residential mortgages (60 percent of total loans), may pose increasing macrofinancial risks. The full effect of the COVID-19 shock on private balance sheets will only be known once temporary support measures end, but stress tests illustrate households' exposure to higher interest rates and corporate vulnerabilities from any renewed revenue losses.

3. The remainder of this paper examines the impact of the COVID-19 shock on household and nonfinancial corporate balance sheets. The paper reviews the pre-COVID-19 landscape in these sectors and discusses developments since the pandemic. Sections B and C explore key questions on (i) the COVID-19 shock's impact on households, including the distributional impact by income and indebtedness; and (ii) the vulnerability of the non-financial corporate (NFC) sector, and how vulnerable SMEs are compared to larger businesses. Section D concludes by discussing implications and policy support options for the post-COVID-19 recovery.

B. What Has Been the Impact on Household Balance Sheets?

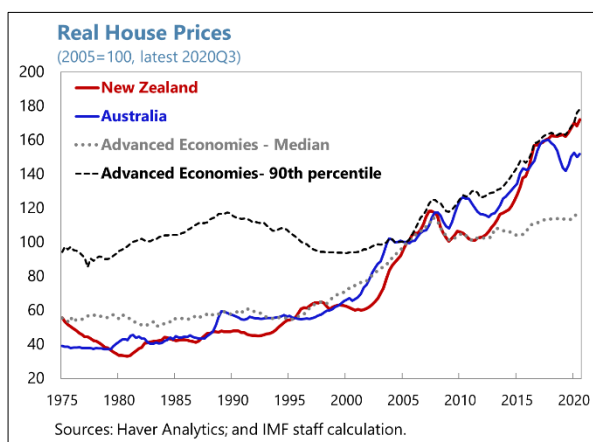
4. Timely support measures at the onset of the crisis have mitigated the immediate economic impact of COVID-19. Economic activity fell sharply amidst the pandemic and the stringent lockdown measures but rebounded strongly in the second half of 2020. Real GDP contracted by 3 percent in 2020, much less than anticipated initially. Prompt fiscal and monetary policy support cushioned the immediate economic impacts. Notably, the large-scale wage subsidy

¹ Prepared by Yu Ching Wong (APD). The chapter benefited from valuable comments by the Treasury of New Zealand and participants at a joint Treasury and Reserve Bank of New Zealand virtual seminar.

(NZ\$14.8 billion or 4.6 percent of GDP), among other fiscal measures, has supported job retention and business cashflows. The lowering of the cash rate by 75 bps to 0.25 percent, together with quantitative easing and the term funding facilities, has enabled financial institutions to lend to households and firms at low borrowing costs. In addition, relief was also provided through six-month principal and interest repayment deferrals to mortgage holders and SMEs affected by COVID-19. As a result, household disposable income has continued to increase by three percent y/y in the year ended in September 2020 (from 4.8 percent y/y in December 2019) and household deposit growth doubled to close to 10 percent y/y in December 2020.

5. Boosted by rising house prices, household net worth continued to increase amid the pandemic.

In New Zealand, changes in housing wealth have largely dominated the movements in household balance sheets historically. Households' net worth was 938 percent of household disposable income in June 2020, an increase of 5.4 percent y/y, comprising of a 4.2 percent y/y increase in housing and land value and 1.3 percent growth in net financial wealth. Based on figures from the Real Estate Institute of New Zealand (REINZ), house prices surged by 24 percent y/y in March 2021. The housing market boom has been driven by historically low mortgage rates, the temporary removal of loan-to-value ratio (LVR) restrictions, and housing supply shortages, despite the economic downturn in the first half of 2020. While asset prices have risen rapidly in many advanced economies, New Zealand's stands out with an increase in real house prices close to the 90th percentile.



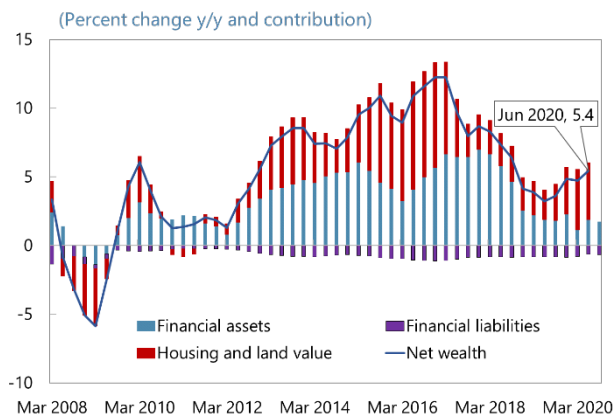
6. The impact of COVID-19 on households' ability to service their mortgages has been manageable, aided by low mortgage rates and a repayment deferrals scheme.

Historically low mortgage rates, largely a consequence of accommodative monetary policy, contributed to a decline in interest payments on housing loans to 5.6 percent of household disposable income in September 2020 (from 6.2 percent in September 2019), despite a continued rise in household debt to 163 percent of household disposable income.² The overall resilience of household balance sheets and wealth effects from rising house prices also supported households' ability to keep up with debt service obligations, in some cases supported by repayment deferrals and restructuring schemes. Balance sheet strength and positive wealth effects also supported consumption, thus contributing to both macroeconomic and financial stability in the wake of the COVID-19 shock.

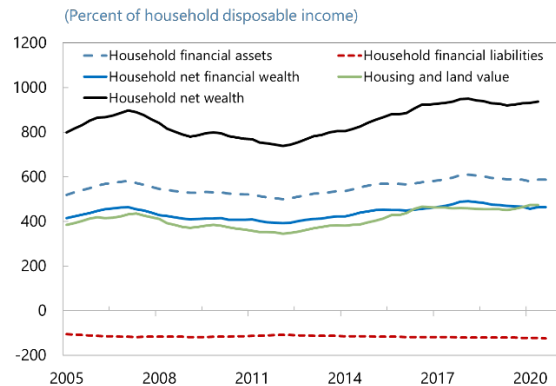
² A debt-servicing ratio—the scheduled principal and interest mortgage repayments to income ratio—would give more information on household liquidity burden. This set of data is not available in the RBNZ's statistics.

Household Balance Sheet (2005-2020Q3)

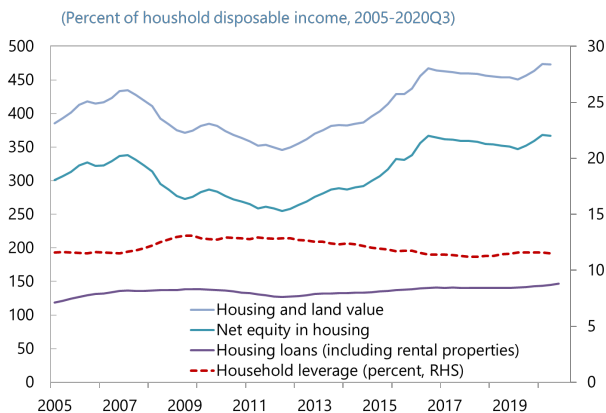
Household Net Worth Continued to Increase, Boosted by Rising Housing and Land Value



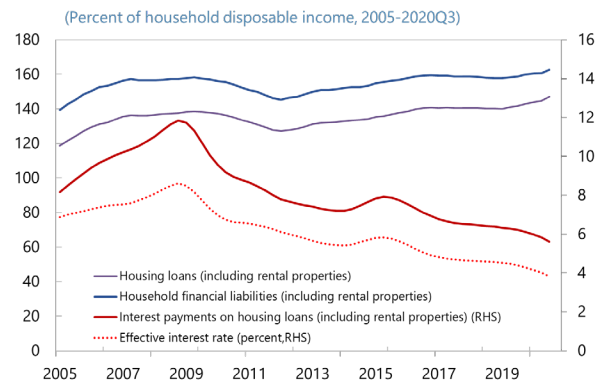
The Household Balance Sheet is Dominated by Financial Assets and Housing Wealth



Net Equity in Housing Continued to Increase While Household Leverage Remained Stable



Interest Rate Cuts Reduced the Interest Payment Burden Despite Rising Household Debt



Sources: RBNZ and IMF staff calculations.

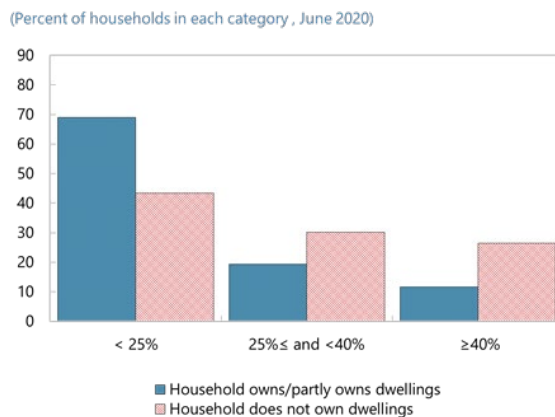
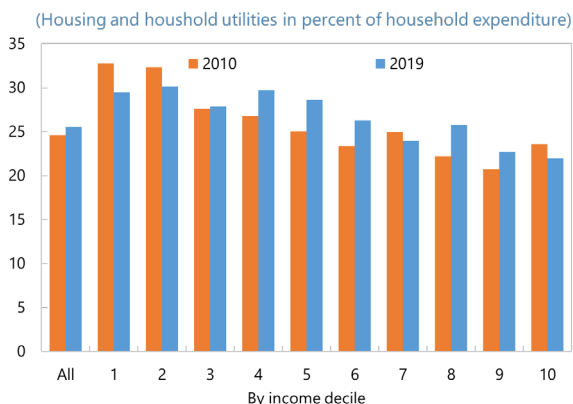
Note: Net wealth is the sum of net financial assets (financial assets minus financial liabilities) and nonfinancial assets (housing and land value). Housing net equity is housing and land value net of housing loans. Household leverage is calculated as financial liabilities over the sum of financial assets and nonfinancial assets.

7. That said, there is considerable heterogeneity across households. The surge in house prices has affordability implications for both rental and owner-occupier households. Rent price inflation, which has slowed during the pandemic owing in part to a six-month freeze on rent increases, would likely move higher with house prices, and potential home buyers face higher house price-to-income ratios. Lower-income households are also more vulnerable to rising housing costs. Results from the *Household Expenditure Survey* show that the bottom half of income groups spent close to 30 percent of their household expenditure on housing and household utilities costs, a higher cost share than the higher income groups. By dwelling ownership, 27 percent of renters spent more than 40 percent of their household disposable income on housing costs as compared to only 12 percent of owner-occupier households.

Housing Costs

Bottom Half of Income Groups Spent Close to 30 Percent of Their Total Expenditure on Housing and Household Utilities Costs.¹

A Higher Share of Rental Households Spent More than 25 Percent of Their Disposable Income on Housing Costs.²

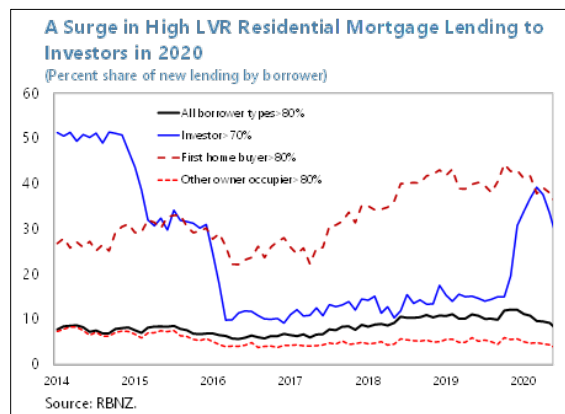


Sources: Stats NZ (Household Income and Housing -cost Statistics, and Household Economic Survey).

¹ Housing costs include expenditure on rent and mortgages (principal and interest repayments), property rates, and building-related insurance.

² Overall, 51 percent of all households surveyed owned dwellings, of which 70 percent or 34 percent of all households were making mortgage payments, and 34 percent of households were making rent payments in June 2020.

8. The recent surge in house prices has pushed up high debt-to-income (DTI) and high loan-to-value mortgage lending in the absence of LVR restrictions. Aided by the temporary relaxation of LVR restrictions (the removal of the 20 percent cap on the issuing of new mortgage loans to owner-occupiers with LVR at more than 80 percent and the five percent cap to investors with LVR at more than 70 percent), high LVR lending to investors has increased sharply.³ In addition, the share of first-home buyers has increased rapidly to 19 percent, and loans with DTI larger than five expanded by 1.8 percentage point of the total new loan commitment in the first nine months of 2020. Overall, mortgage lending with high DTI ratio (higher than five) by owner-occupiers gained share in



	New Zealand: Residential Mortgage Lending by Borrower Type						Investors 1/
	First Home Buyers			Other Owner-Occupiers			
	TDI>5	TDI>5, LVR>80%	TDI>5, LVR>80%	TDI>5	TDI>5, LVR>80%	TDI>5, LVR>80%	
2017 2/	15	5	1	47	16	1	32
2018	16	5	2	46	15	1	34
2019	18	6	2	44	13	1	35
2020 2/	19	8	3	40	14	1	37

Sources: RBNZ and IMF staff calculations.
1/ Estimated.
2/ For 2017, data are available for June-December. For 2020, data are up to September.

³ LVR restrictions were reinstated at pre-existing levels from March 2021 and further tightened for investor loans effective May 2021.

2020. The removal of LVR restrictions eased deposit requirement constraints facing borrowers, while exposing households and banks to higher risks of falling into negative equity in the event of a large house price correction.

9. The longer-term COVID-19 impact on household balance sheets and resilience warrants close monitoring.

- Vulnerability from elevated household debt levels.** Under the mortgage payment deferral scheme, banks provided repayment deferrals to about 8 percent of mortgages outstanding at the peak of the COVID-19 crisis in May 2020, and less than one percent of mortgage lending remained on deferral by early January 2021. However, the exit from deferrals has been aided often by term extensions, and around NZ\$12.8 billion or 4.3 percent of mortgage lending has been restructured to interest-only loans. This would imply higher indebtedness of households over a longer term, raising their financial vulnerability.
- Vulnerability to interest rate shocks.** If interest rates begin to normalize earlier than expected, the rise in interest burden on households could be substantial. A one percentage point increase in the mortgage rate is estimated to raise household interest servicing burden to about 7 percent of household disposable income, from 5.6 percent in September 2020. As most mortgages are in 2 to 3-year fixed rates, the impact of changes in benchmark mortgage rates on borrowers is faster

compared to other countries dominated by 10-year or longer fixed rates. Further, a simulation based on a principal and interest loan using average household disposable income and actual median national house prices suggests that a one percentage point increase in the mortgage rate would increase total principal and interest repayments from currently 36 percent to 41 percent of household disposable income, exceeding the conventional affordability range of 25-40 percent.

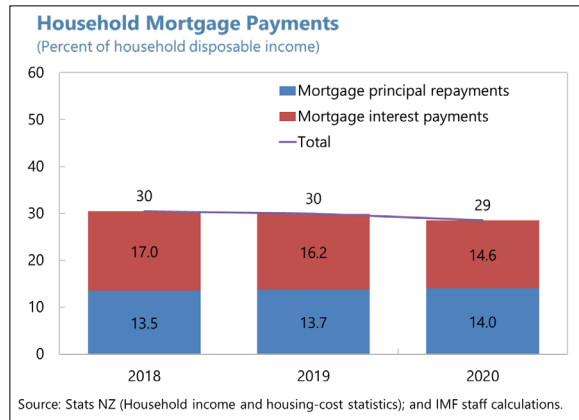
New Zealand: Impact of Interest Rate Changes on Interest Servicing Burden			
	Baseline Sep-20	Alternative	
			(% change)
Implicit Interest rate (percent)	3.8	4.8	1.0
Interest payments (NZ\$ bil)	11	14	26
(Percent of household disposable income)	5.6	7.1	1.5
Housing loan outstanding (NZ\$ bil)	290		
Household disposable income (NZ\$ bil)	198		

Sources: RBNZ and IMF staff estimates.

New Zealand: Impact of Mortgage Rate Changes on Households' Housing Costs			
	2020Q4	Percentage Point Change	
Mortgage rate (percent) 1/	3.3	-1	+1
Mortgage debt services (percent of average annual household disposable income) 2/	36	32	41

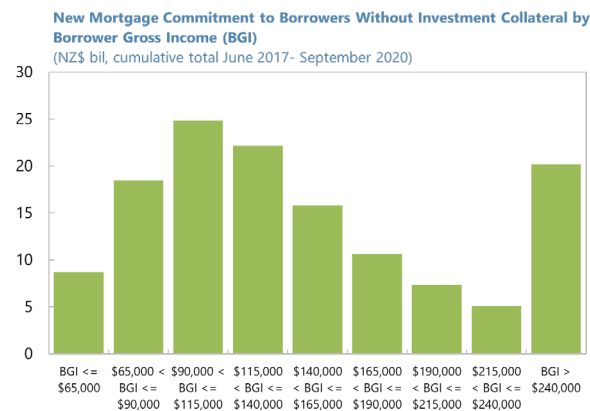
Sources: Stats NZ; Haver Analytics; and IMF staff calculations.
 1/ Average 1-year residential mortgage rate (end-of-period).
 2/ Based on a principal and interest loan of 30-year maturity with a down payment of 20 percent of the house price, using national median house prices and estimated annual household disposable income in end-2020.

- Vulnerabilities from rising house prices.** Higher house prices have partially offset the benefits from lower mortgage rates for new home buyers. This is consistent with latest household survey data, which show an increasing share of principal repayments in total mortgage repayments from 2019 to 2020, likely due to larger loan size. This trend is likely to continue with elevated house price levels.

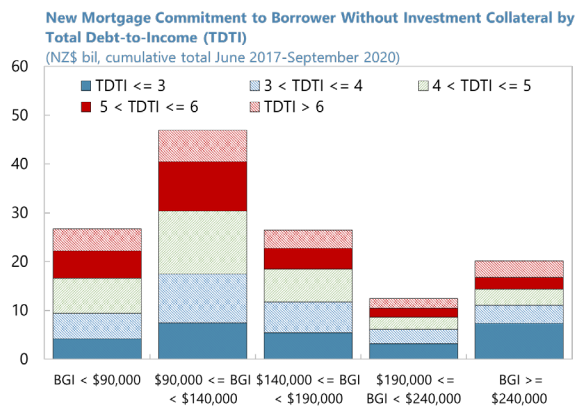


- Vulnerability of lower-income borrowers to high debt-to-income levels.** New mortgage commitment data recently published by the RBNZ indicated that two-thirds of owner-occupier loans are concentrated in the bottom five income groups. With the median annual household income at about NZ\$88,000 in June-2020, owner-occupiers with gross income at NZ\$90,000 or less accounted for about 20 percent of these loans. About 23 percent of loans with DTI higher than five are concentrated in this group of borrowers. These indicators are broadly consistent with the observation that as home ownership has become more expensive, first-home buyers, more likely to be still in lower income brackets, are taking out relatively larger mortgages compared to their income. Household spending adjustments are thereby more likely to be amplified and financial stability risk heightened under a stress scenario with debt concentrated among households with limited buffers.⁴

One fifth of owner-occupier loans are in households at or less than median household income...



...with close to one-quarter of TDTI>5 loans in this household group.

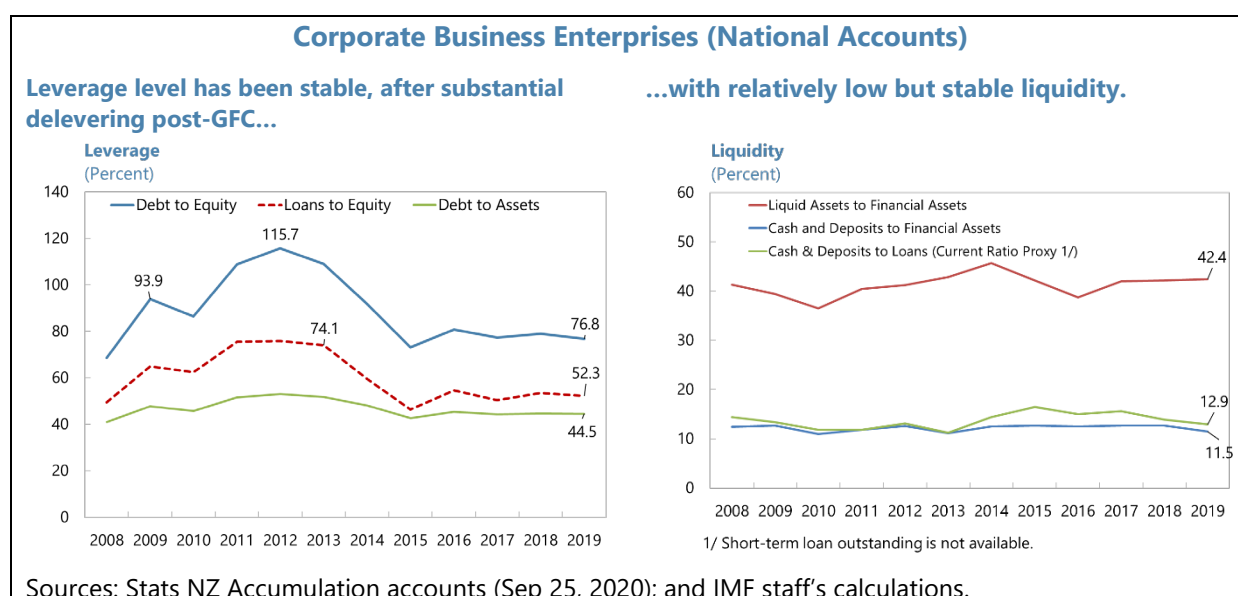


Sources: RBNZ; and IMF staff's calculations.

⁴ Less clear is the risk profile of investors' mortgage loans. Household debt data from Statistics New Zealand Household Economic Survey and RBNZ only cover first-home buyers and owner-occupiers. The DTI and income levels of investor loans or debt secured on other properties are not published.

C. How Vulnerable Are Non-Financial Corporations?

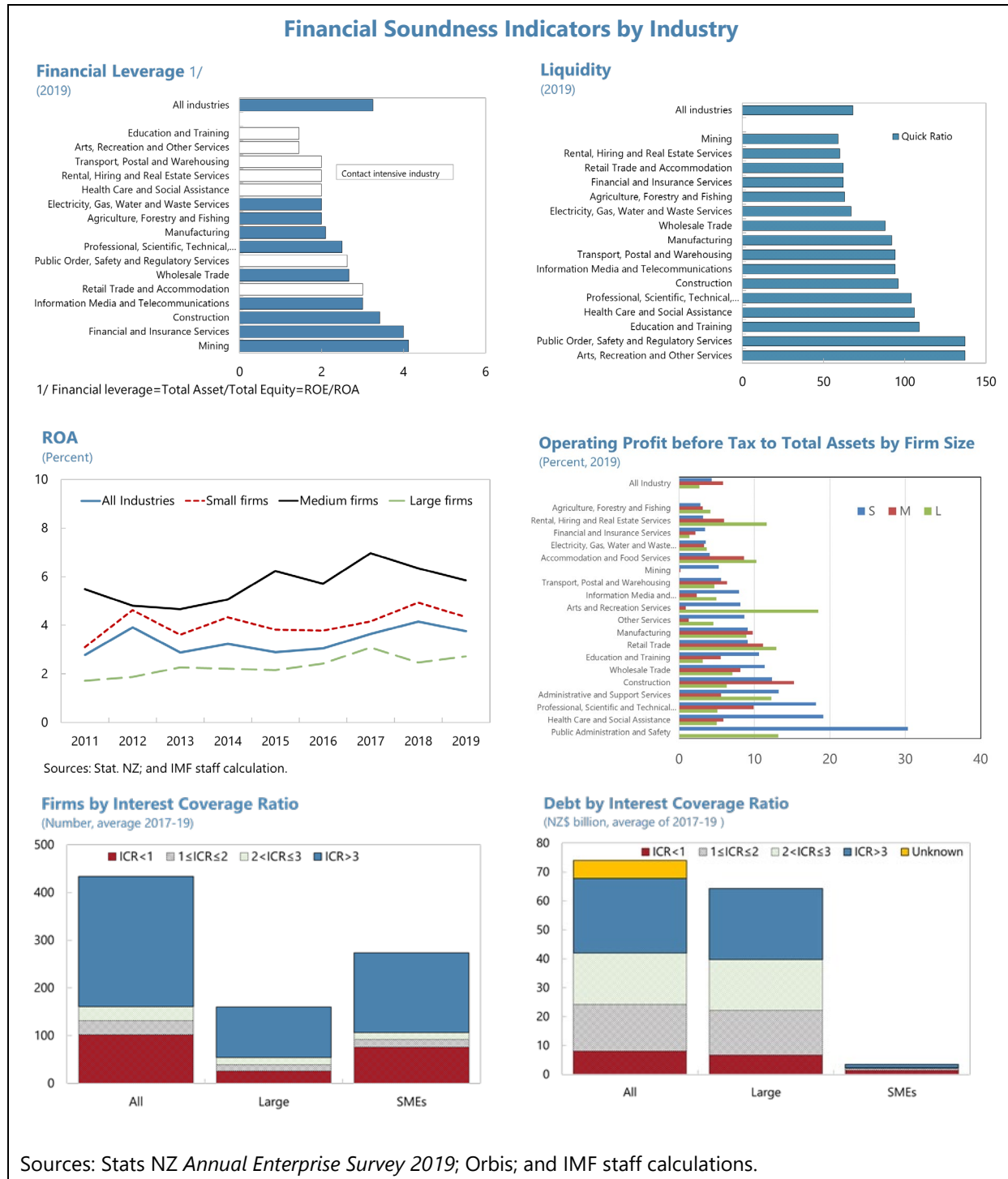
10. Before the pandemic, leverage levels of corporate business enterprises were relatively low and stable, albeit with moderate liquidity ratios. Based on balance sheet positions and financial accounts data in the national accounts, the size of the non-financial corporate sector has been shrinking relative to the size of the economy, as total assets declined from the peak at 350 percent of GDP in 2009 to 306 percent of GDP in 2019. This is in sharp contrast to the household sector, which doubled its asset size as share of GDP during this period. Corporate leverage, measured by the debt-to-equity ratio, has remained relatively low and stable at around 77 percent since 2015. Cash and deposits, at about 12 percent of financial assets, are relatively low. Low liquidity could be largely reflecting smaller firm size and the domination of firms in the services sector. An international comparison of firms' financial soundness indicators suggests that New Zealand's non-financial corporations (NFCs) are relatively low in leverage, profitable, and with moderate liquidity (Figure 1).



11. The performance of NFCs, however, has varied across industries and firm size. The *Annual Enterprise Survey* suggests that contact-intensive industries are generally not more financially leveraged than other industries, however with the important exception of the retail trade and accommodation industries. Overall, small firms are more profitable than larger firms, but contact-intensive industries such as accommodation and food services rank low on profitability.⁵ Firm-level data suggests that close to one quarter of firms (comprising of 16 percent of large firms and 30 percent of small and medium enterprises (SMEs)) have a liquidity ratio (cash cover of short-

⁵ The business sector comprises of a total of 546,740 enterprises as of Feb 2019, with 2.3 million paid employees over 19 industries. SMEs dominate in New Zealand, 97 percent of firms are small firms with fewer than 20 employees and about 52 percent of employees are employed by SMEs. According to MBIE, there is no official definition of a small business in New Zealand while enterprises with fewer than 20 employees has traditionally been used as the threshold.

term borrowing) of less than one, corresponding to about 12 percent of total corporate debt from firm-level data.⁶

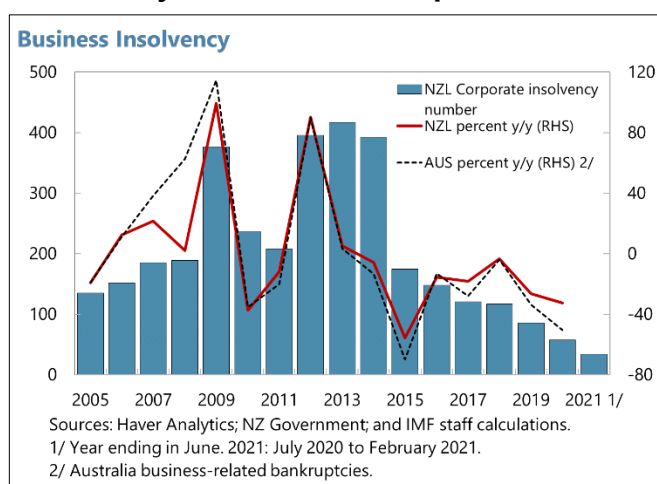


⁶ This paper uses a threshold at the 75th percentile of revenue for the classification of SMEs due to the sparse availability of firms' employee number in the Orbis firm-level data.

12. So far, NFCs have weathered the pandemic downturn well, owing to the large and prompt COVID-19 support measures. Most firms faced large revenue hits and supply chain disruptions amidst lockdowns and a demand crunch at the peak of the crisis around 2020Q2. The wage subsidy program has been instrumental in providing lifeline to firms, supporting more than 60 percent of jobs through NZ\$9.4 billion paid to about 1.5 million unique jobs. The proportion of jobs in accommodation and food services supported by the wage subsidy was the highest, at 93 percent. Other financing support include the loan and mortgage deferral programs, and the Government's COVID-19 Small Business Cashflow Loan (SBCS) and Business Finance Guarantee Schemes (BFGS). Additionally, the quick adaptability of some small businesses to tech-driven solutions amidst a rapid shift in business practices may have also cushioned the shock.

13. Sales and employment in SMEs are generally recovering towards pre-crisis levels. While timely data for SMEs' performance are scarce, indicators from *Xero Small Business Insights* (XSBI) based on firms' usage of its accounting software data showed that New Zealand's SMEs revenue grew by 1.4 percent y/y in December 2020, higher than small firms in Australia (-2.7 percent). Small business jobs grew by 3.2 percent y/y in December. All industries recorded job numbers that were higher than pre-crisis levels in March 2020, except jobs in hospitality remained below pre-crisis levels, down by 4.9 percent since March 2020. Tourism-dependent Queenstown was hit hard in December 2020, with overall revenue down 21.4 percent y/y.

14. Business bankruptcies have declined substantially in 2020 amidst the pandemic recession. This unusually low level of business bankruptcies, a trend that is also observed in other advanced economy peers such as Australia, is largely due to the government's COVID-19 response. This includes the loan deferral scheme offered by banks and the government's Business Debt Hibernation scheme which allowed businesses to place their existing debts on hold. However, corporate bankruptcies are expected to rise, given the phasing out of these support measures in 2021 and delayed administrative processes.



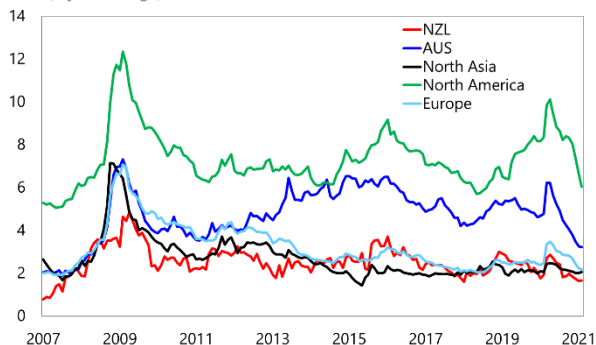
15. The default probability of New Zealand firms in tourism has risen with the continued closure of the international border. The Expected Default Frequency (EDF), calculated by Moody's, measures the probability that a firm (with publicly traded equity) will default on payments over a specific period of time (typically one year) when the market value of its assets falls below its liabilities payable. The overall EDF in New Zealand rose at the outset of the COVID-19 crisis, though less markedly than that of most other advanced economies. It has since largely come down again, although some industries remain disproportionately affected, especially tourism and transportation.

A Comparison of Expected Default Frequencies ^{1 2}

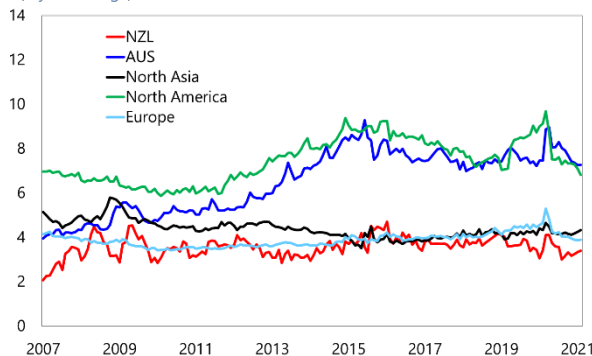
EDFs in most advanced economies rose at the outset of the COVID-19 pandemic...

...but have since broadly declined, with less movement over longer horizons.

EDF in New Zealand and Other Advanced Economies (1-year average)



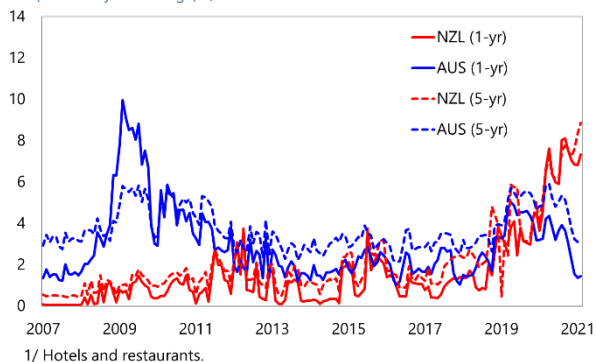
EDF in New Zealand and Other Advanced Economies (5-year average)



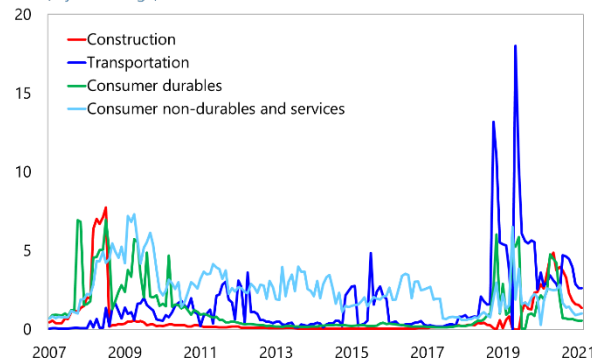
Nevertheless, the default probability of New Zealand's tourism industry has risen...

...while EDFs in selected other sectors remain above pre-crisis levels.

EDF in New Zealand and Australia Tourism Industry (1- and 5-year average) 1/



EDF in New Zealand by Selected Sectors (1-year average)



Sources: Moody's Credit Edge and IMF staff calculations.

¹ Three key values determine a firm's EDF credit measure: the current market value of the firm (market value of assets); the level of the firm's obligations (default point); and the vulnerability of the market value to large changes (asset volatility).

² About six outlier monthly data points from October 2018-June 2019 have been omitted from NZL 1-year and NZL 5-year EDFs.

16. Further, a sizable portion of corporate debt could be at risk due to liquidity vulnerability under stressed scenarios. While the economy has rebounded strongly, the corporate sector is still exposed to significant risks given the high uncertainty in the trajectory of the pandemic. Corporate vulnerability analysis suggests that leverage levels for SMEs and liquidity for large firms are areas of potential vulnerability (Box 1). About one quarter of total debt in the sample

Box 1. Estimates of Corporate Debt at Risk

The corporate vulnerability index (CVI), based on the concept of Debt at Risk (DaR), estimates the total debt outstanding associated with firms that are deemed financially vulnerable. Following the CVI monitoring framework developed by Feyen et. al. (2017), it covers four key aspects of financial vulnerability that are leading indicators for corporate financial distress based on balance sheet information. Extending DaR to multiple indicators captures the intensity of debt at risk, that is the share of debt that is considered vulnerable by one or more indicators at the same time.

The selected thresholds for corporate financial vulnerability are:

Debt service capacity: DaR1: Interest coverage ratio (ICR < 1)

Leverage: DaR2: Debt to Asset (> 90th percentile within the same industry in 2010-19)

DaR3: Net debt (total debt minus cash and cash equivalent) to EBIT (> 90th percentile within the same industry in 2010-19)

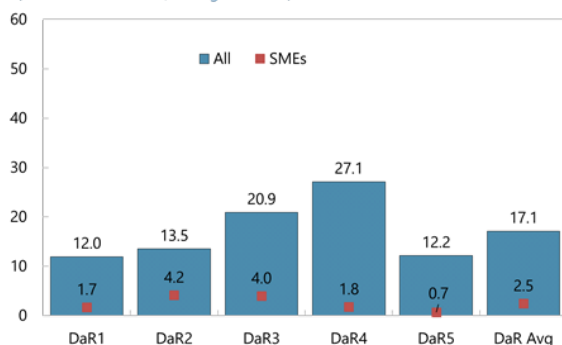
Rollover/Liquidity: DaR4: Quick ratio, current assets minus inventories over current liabilities (< 10th percentile within the same industry in 2010-19)

Profitability: DaR5: Return on assets (net income/total assets) (< 10th percentile within the same industry in 2010-19)

More than one-quarter of total debt considered at risk based on rollover or liquidity vulnerability.

Debt at Risk

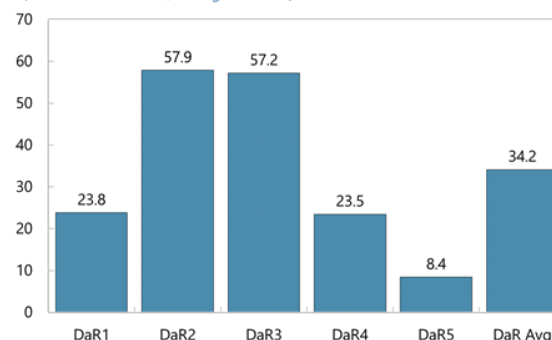
(Percent of total debt, average 2017-19)



Over one half of SMEs debt could be at risk due to higher leverage.

Debt at Risk - SMEs

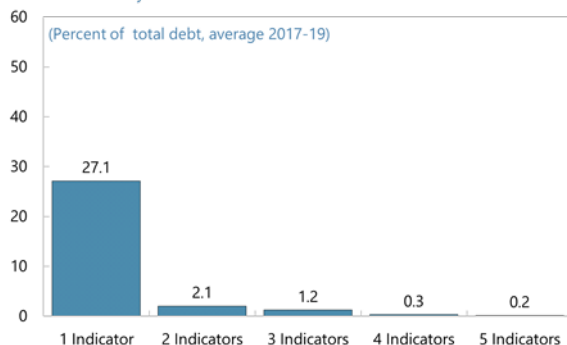
(Percent of SME debt, average 2017-19)



Total debt at risk declined substantially according to more than one indicator.

Intensity of Corporate Vulnerability - All Firms

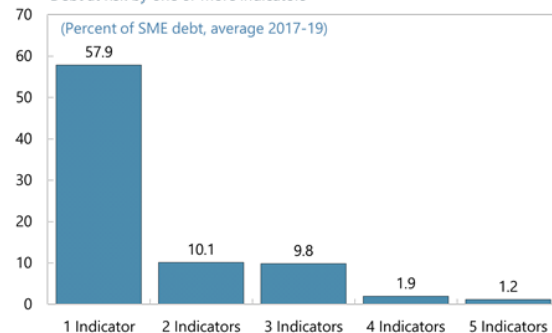
Debt at risk by one or more indicators



In contrast, about one-tenth of SME debt considered at risk by three indicators.

Intensity of Corporate Vulnerability - SMEs only

Debt at risk by one or more indicators



Sources: Orbis; and IMF staff calculations.

Note: This analysis took an average of 2017-19. There is a reporting lag in Orbis database of about two years. See Annex I for details of the firm-level sample.

of firms could be at risk based on liquidity vulnerability. For SMEs, about one half of debt in the sample could be at risk due to higher leverage, while one tenth of SME debt could be at risk measured by three indicators simultaneously, comprising of one or two leverage measures and the liquidity indicator.

17. Liquidity shortfalls that are prolonged would raise the risk of firm insolvency. A simple simulation illustrates the potential magnitude of liquidity shortfalls in NFCs in event of a recurrent shock resulting in a sharp fall in sales (Box 2). Limited options to deal with liquidity shortfalls could impair the long-term viability of many firms. While the initial health of firms' balance sheets is important, evidence also suggests that firms facing a high risk of liquidity shortages are mostly profitable and viable (OECD 2020). The experience in New Zealand on the successful use of the wage subsidy to help bridge corporates' cashflow requirements is consistent with findings from OECD (2020) that direct and indirect support to wage payments seems to be the most critical support to firms, given the high share of wage costs in firms' total spending.

D. Implications from Findings and Policy Options

18. Households and firms have weathered the pandemic storm well. Initial relative strength of the household and NFC balance sheets and strong fiscal and monetary support have helped. Banks in New Zealand are sound and well capitalized, allowing them to maintain credit supply to households and businesses. A stress test by the RBNZ in early 2020 suggests that banks capital position would provide sufficient buffers to severe but plausible shocks.

19. However, there are pockets of vulnerability and some adverse impacts will be lagged. The surge in house prices during the pandemic has increased leverage levels of some new buyers and particularly exposed lower-income households, including first home buyers, to high debt-to-income mortgage borrowing. As a result, households' vulnerability to interest rate shocks and elevated debt levels has increased. In addition, SMEs and firms in the services and tourism sectors most exposed to social distancing and border closure are vulnerable to liquidity shortfalls and insolvency. While the New Zealand economy is on track for a continued recovery, uncertainty remains high, depending on the trajectory of the pandemic, pace of recovery in trading partners and the opening of the international border. The deterioration of loan portfolios and the insolvency rate will likely increase as support measures are phased out.

20. The phasing out of policy support will need to be well-timed, with appropriate refocusing on viable loans and solvent firms. While a blanket approach to providing emergency cashflow relief worked well at the depth of the pandemic, the next phase would warrant a more targeted approach to firms that are viable.⁷ In this context, support measures such as the SBCS are designed to be temporary and are capped at low levels to reduce the risks of supporting unviable

⁷ For example, a NZ\$400 million Tourism Recovery Package under the Budget 2020 was allocated to protect strategic tourism businesses, drive domestic tourism through regional events and lift digital capability in the tourism industry.

Box 2. Risk of Liquidity Shortages and Equity Shortfalls

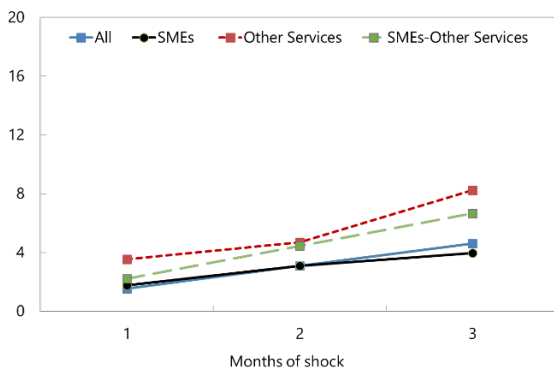
Simulation results based on firm-level data from Orbis suggest that under a stress scenario of a 50 percent decline in turnover, about 5 percent of firms will have liquidity shortfalls after three months. Under a more severe stress scenario of a 75 percent fall in turnover for three months, about 12 percent of all firms, 10 percent of SMEs, and 18 percent of SMEs in services could encounter liquidity shortfalls.

The share of firms expected to become insolvent is smaller, ranging between 1-7 percent under the two stress scenarios. However, these estimates are likely to be a lower bound given the sample bias towards healthier firms, the use of pre-COVID-19 balance sheet data, and the likely less stringent criteria of balance sheet insolvency.

The share of firms by firm size facing liquidity shortfalls is similar ...

Scenario A - Revenue Down by 50 percent

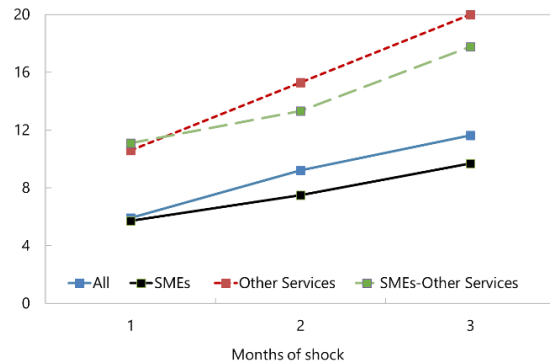
(Percent of firms with liquidity shortfalls)



...while services firms are far more prone to liquidity shortfalls.

Scenario B - Revenue Down by 75 percent

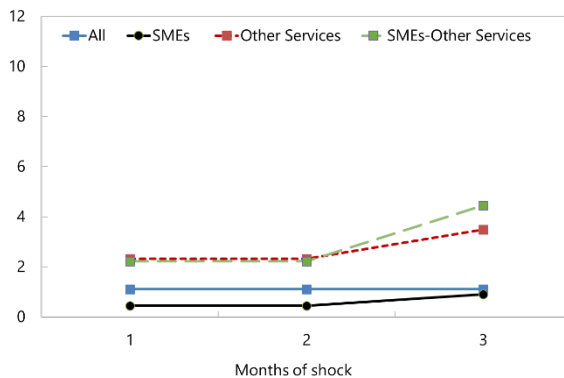
(Percent of firms with liquidity shortfalls)



The share of firms becoming insolvent is low...

Scenario A - Revenue Down by 50 percent

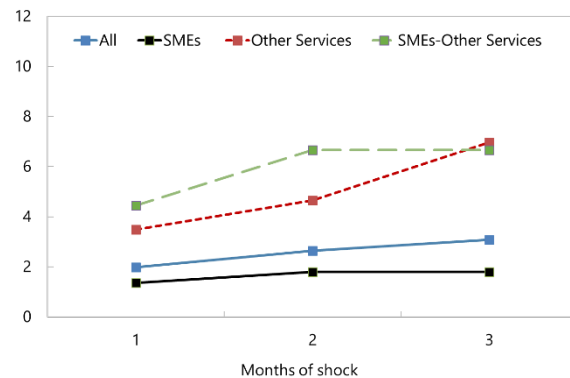
(Percent of firms with equity shortfalls)



...while a higher share of services firms face equity shortfalls under a severe drop in turnover.

Scenario B - Revenue Down by 75 percent

(Percent of firms with equity shortfalls)



Sources: Orbis; and IMF staff calculation.

Note: Methodology based on OECD (2020). See Annex I for details.

firms.⁸ A greater reliance on the bank lending channel, supplemented with targeted credit guarantee schemes, for business financing needs would help ensure that credits go to viable projects that generate adequate investment return. Applying a higher expected rate of return for supporting firms in severely affected sectors such as tourism could foster restructuring and resource reallocation.

21. SME financing and targeted approaches could become more important as the economy recovers. The ability of SMEs to access cash buffers, new borrowing for investment, or emergency relief support, will affect their liquidity and solvency, and in turn whether the pandemic shock will lead to more widespread corporate bankruptcies and a scarring impact on the economy. Continued efforts to improve the design and access to SME financing, guaranteed credit and small-scale cashflow grants will be important.

22. Macroprudential policy should be actively used to safeguard financial stability. Tools to potentially limit households' DTI exposure and secure adequate debt serviceability buffers should be readily at the RBNZ's disposal. The concentration in banks' exposures to housing loans also generates structural vulnerabilities that need to be addressed. More broadly, the concentration of lending to finance households' leveraged property investments may have come at the expense of a relatively low-leveraged corporate sector that is lacking in dynamic investment that could contribute to productivity growth. In parallel, there is a need for comprehensive policy measures to support affordability of housing, including by ensuring a swift and adequately large supply response.

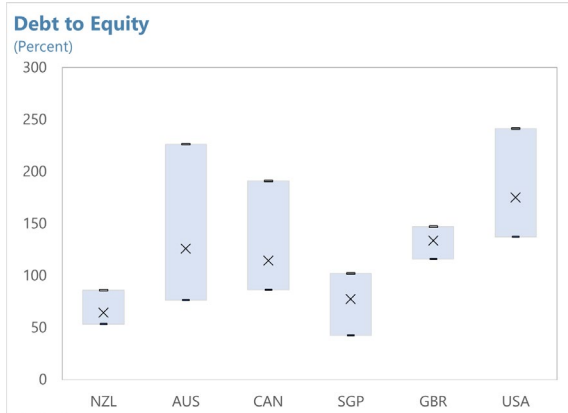
23. Addressing data gaps is important to support timely and targeted policy responses. More could be done to improve the timely availability of data, and additional data collection to fill data gaps could be considered.⁹ On housing loans, making available the DTI and income profile of investors as well as the size and distribution of interest-only loans would allow a more complete risk assessment of household debt. On NFCs, a higher frequency and more timely availability of the Enterprise Survey would allow for more timely assessment of corporate balance sheet health and performance. Monthly indicators of SME performance from commercial sources could be incorporated for monitoring and policy assessment purposes.

⁸ The Small Business Cashflow Scheme (SBCS), extended until the end of 2023, provides small businesses a 5-year loan under eligible criteria which include at least a 30 percent decline in revenue over a 14-day period in the previous 6 months, compared with the same 14-day period a year ago. The maximum amount of loan is NZ\$10,000 plus NZ\$1,800 per full-time-equivalent employee.

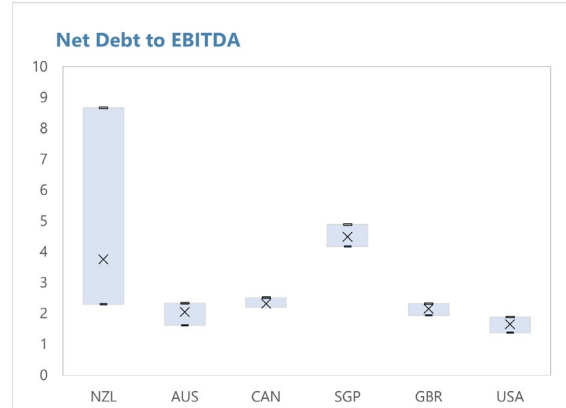
⁹ See IMF (2015) for broader application of balance sheet analysis to identify vulnerabilities and tracing the transmission of potential shocks and policies.

Figure 1. New Zealand: Selected Financial Indicators for Non-Financial Corporations, 2014-19 1/

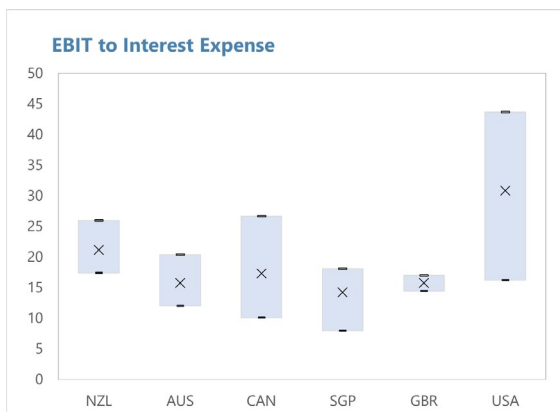
New Zealand's firms' leverage level has been relatively low and stable...



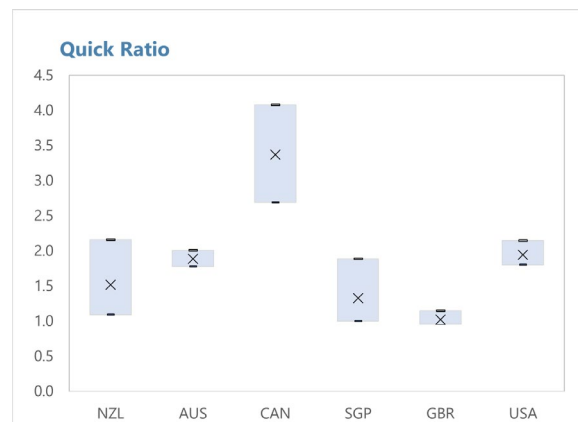
...with a large variation in earnings.



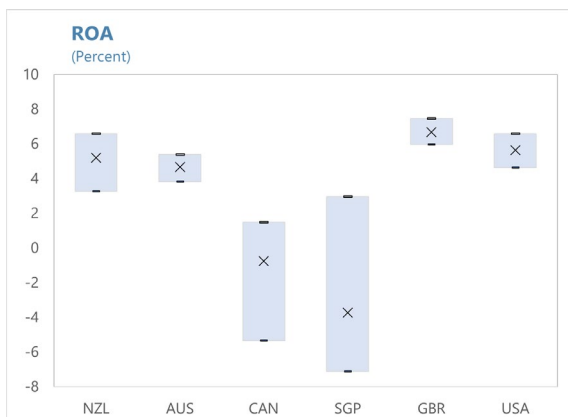
Interest coverage is on par with other countries...



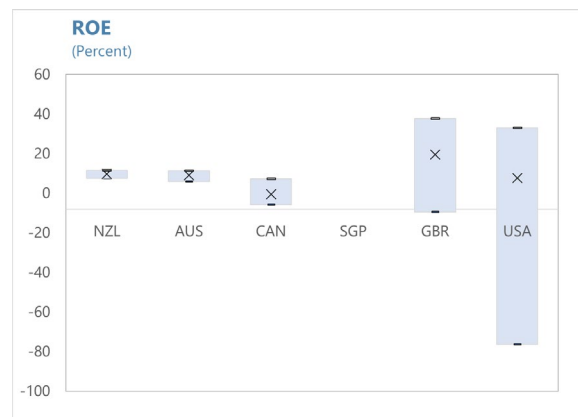
...with slightly lower liquidity than other countries.



Profitability is relatively high...



... with little fluctuation.



Sources: S&P Capital IQ; and IMF staff calculations.

1/ Boxplots include the mean (cross), the minimum and the maximum of market cap weighted mean of each year, over 2014-19.

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Annex I. Additional Data and Background of the Firm-Level Analysis

Table I.1. New Zealand: Firm-Level Descriptive Statistics

Variable	p10	p25	p50	p75	p90	Mean
Interest cover	-3	1	6	19	94	42
Leverage (debt/assets)	0	0	7	30	52	19
Net debt/EBIT	-534	-142	0	306	921	320
Quick ratio	0	1	1	2	4	2
ROA	-5	1	5	9	18	5
Operating revenue (Thousand NZ\$)	5,698	15,773	32,307	98,319	299,266	192,123
Equity (Thousand NZ\$)	85	4,101	9,806	28,861	154,712	97,692
Cash & cash equivalent (Thousand NZ\$)	261	1,094	2,975	7,372	20,332	13,872
Costs of employees (Thousand NZ\$)	298	1,367	3,430	13,796	59,026	26,863
Taxation (Thousand NZ\$)	-216	58	439	1,297	6,155	3,558
Interest paid (Thousand NZ\$)	1	42	351	2,340	10,317	8,553
Depreciation & amortization (Thousand NZ\$)	8	72	388	1,922	11,422	9,277

Sources: Orbis data and IMF staff calculations.

Sector distribution of firms and the debt-at-risk thresholds (Box 1)

Table I.2. New Zealand: Thresholds for Financial Vulnerability Classification ¹

Major Sector	Obs	Share Percent	Leverage p90	Net Debt/EBIT p90	Quick Ratio p10	ROA p10
Chemicals, rubber, plastics, non-metallic products	79	5.5	43	565	0.39	-13.1
Construction	44	3.1	59	743	0.40	-3.1
Education, Health	34	2.4	46	1892	0.07	-11.3
Food, beverages, tobacco	70	4.9	51	916	0.28	-8.1
Gas, Water, Electricity	44	3.1	66	1551	0.27	-3.4
Hotels & restaurants	34	2.4	66	1551	0.09	-2.3
Machinery, equipment, furniture, recycling	104	7.2	64	700	0.50	-11.7
Metals & metal products	22	1.5	34	389	0.48	-9.3
Other services	341	23.7	54	670	0.42	-4.6
Post & telecommunications	20	1.4	56	1245	0.38	-0.3
Primary sector	89	6.2	49	655	0.36	-3.1
Public administration & defense	2	0.1	57	1520	0.84	1.3
Publishing, printing	22	1.5	42	963	0.40	-11.7
Textiles, wearing apparel, leather	12	0.8	98	1210	0.24	-15.4
Transport	87	6.1	74	1357	0.33	-5.2
Wholesale & retail trade	419	29.2	48	901	0.28	-2.7
Wood, cork, paper	14	1.0	76	199	0.13	-20.2
All	1437	100.0	53	901	0.32	-6.6

Sources: Orbis data and IMF staff calculations.

¹ Calculated for the whole sample 2010-19.

Risk of Liquidity Shortages and Equity Shortfalls (Box 2)

Based on similar methodology to evaluate firms' liquidity position during the COVID-19 crisis by OECD (2020), this analysis simulates the economic shock from the sales decline and firms' limited ability to fully adjust their operating expenses on their cash flow position. For each month, firms' cash flow is determined by changes in turnover and subtracting from it changes in costs of intermediate inputs, wage bills, taxes, and interest payments (Equations 1 and 2). The liquidity available to each firm is the sum of cash and cash equivalent in the initial month and the estimated cash flow in the subsequent months (Equation 3). Equity shortfall is calculated as the equity in the previous month plus net cashflow and deducting amortization (Equation 4).¹

Scenario I assumed a 50 percent decline in every firm's turnover similar to the magnitude of decline experienced during the COVID-19 lockdown, and scenario II assumed a more severe 75 percent drop in turnover, at one- to three-months horizons.

$$\text{Cashflow}(t) = (1 - s) * \text{Revenue} - (1 - s * c) * \text{Material Costs} - \text{Wages} - \text{Taxes}(t) - \text{Interest payments} \quad (1)$$

$$\text{Taxes}(t) = \text{Max}(0, (1 - s) * \text{Revenue} - (1 - s * c) * \text{Material Costs} - \text{Wages} - \text{Interest payments}) * \text{corporate tax} \quad (2)$$

$$\text{Liquidity}(t) = \text{liquidity}(t - 1) + \text{Cashflow}(t) \quad (3)$$

$$\text{Equity}(t) = \text{Equity}(t - 1) + \text{Cashflow}(t) - \text{Amortization} \quad (4)$$

where s is the size of the shock in month t and c is the elasticity of material costs to sales. Following OECD (2020), c is assumed at 0.8. Operating revenue (turnover), wages, and interest payments are one-twelfth of the respective annual data. Variables are 2019 or latest available (mostly from 2018). As material costs are not available for most sample firms, we assume an elasticity of 0.8 against changes in *operating revenue (turnover)* based on sample statistics in OECD (2020). Corporate tax rate is 28 percent. *Depreciation and amortization* is used as debt principal repayment data are not available.

The liquidity shortfall simulation omits about 8 percent of firms in the sample that recorded negative cash and cash equivalent in the latest available year. Similarly, the equity shortfall simulation excludes about 9-10 percent of firms in the sample that have zero or negative equity in the latest available year.

¹ Cash flow and balance sheet insolvency tests are the two predominant means of determining insolvency. A company is cash flow insolvent if it is unable to pay its debts as they fall due. Balance sheet or technical insolvency occurs where the value of a company's assets is less than its liabilities (including both contingent and prospective liabilities).

HOW FAST CAN NEW ZEALAND GROW AFTER THE PANDEMIC? CHALLENGES AND OPPORTUNITIES ¹

While New Zealand's economy has begun to recover more rapidly from COVID-19-related lockdowns than most advanced economies, the pandemic is nonetheless likely to have a long-lasting impact on New Zealand's potential output. Reduced migration, lower capital accumulation, and reduced productivity growth are expected to take a toll. To minimize scarring effects of the pandemic and lift medium-term growth, New Zealand should embark on reforms to address long-standing weak productivity and the infrastructure gap and accelerate product market reforms.

A. Introduction

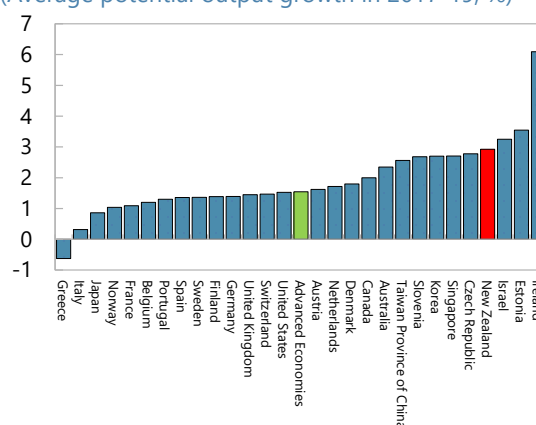
1. The pandemic is likely to have a sizable impact on medium-term output. Previous recessions in advanced economies have had long-lasting impacts on potential output. Similarly, despite a strong, initial post-lockdown recovery in the second half of 2020, supported by strong pent-up demand, we expect the pandemic to have a sizeable medium-term impact on New Zealand's potential output. The impact will be driven by lower inward migration due to the border closure, reduced capital accumulation, and reduced productivity growth.² A strong policy focus on addressing pre-existing structural issues and limit scarring effects are warranted.

2. This paper analyzes the medium-term impact of the pandemic on New Zealand's potential output and discusses policy options to mitigate this effect. Section B discusses New Zealand's potential output before the pandemic. Section C analyzes the lessons from previous recessions in advanced economies, to give historical context to the 2020 recession. Section D discusses the impact of the pandemic on New Zealand's medium-term potential output. Section E takes a closer look at New Zealand's structural reform opportunities and discusses policy options to lift medium-term potential output.

B. Drivers of Growth in New Zealand Before the Pandemic³

3. Before the pandemic, the growth of potential output was driven by strong population growth. New Zealand's potential output before the pandemic and the fundamental drivers of its growth are analyzed by a multivariate model that incorporates a Phillips curve and Okun's law (Blagrove and others, 2015). While New Zealand's potential

Potential Output Growth in New Zealand Was Relatively High Before COVID.
(Average potential output growth in 2017-19, %)



Source: IMF staff calculations.

¹ Prepared by Yosuke Kido. The chapter benefited from valuable comments by the Treasury of New Zealand, Reserve Bank of New Zealand, and participants at a virtual seminar.

² Unless specified otherwise, the term productivity in this paper refers to total factor productivity.

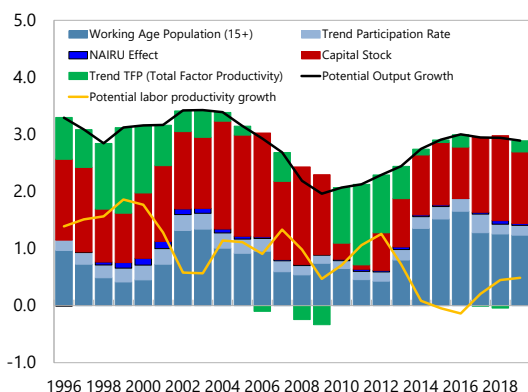
³ The analysis in sections B through D draws on Bannister and others (2020).

output growth in recent years was relatively high compared to peer advanced economies, with an average growth rate of 2.9 percent over 2017-19, it was largely driven by strong working age population growth due to a surge in net migration. By contrast, productivity growth slowed down markedly over the past decade and has been low compared to peers.⁴ By 2019, it only contributed 0.2 percentage point to potential output growth.

4. Capital accumulation was weak compared to population growth. Although it picked up in recent years before the pandemic, the pace of capital accumulation in New Zealand was slow compared to strong population growth boosted by migration, resulting in slower capital deepening. Capital shallowing or slowdown of capital deepening was observed in some sectors, which weighed on labor productivity growth in those sectors.

Productivity Slowdown Was Masked by Strong Population Growth

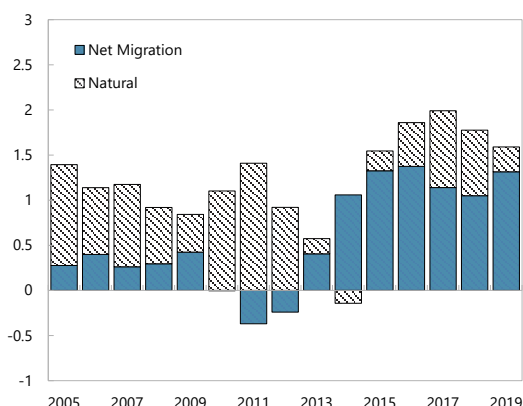
(Contributions to potential output growth, percentage points)



Note: Bars are contributions to potential output growth. Sources: Stats NZ and IMF staff calculation

Population Growth Was Boosted by Migration

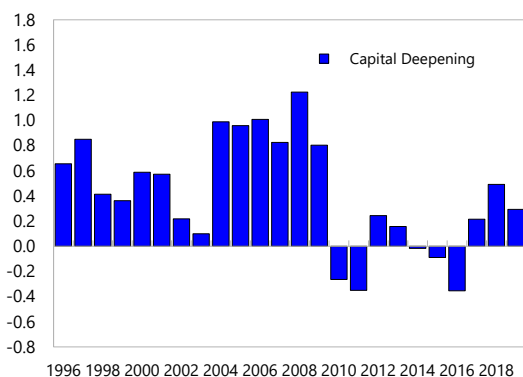
(Contributions to population growth, percentage points)



Sources: Statistics New Zealand

Capital Deepening Had Slowed

(Contribution of capital deepening to potential output, percentage points)



Sources: IMF staff calculations. Note: Capital deepening is defined as the change in capital stock per unit of potential labor input.

Capital Shallowing Was Observed in Some Sectors

(Average capital deepening by sector, percent)

	1996-2009	2010-2019	Difference
Accommodation and food services	2.4	-2.3	-4.6
Electricity, gas, water, and waste services	3.2	-0.4	-3.6
Information media and telecom.	5.2	2.9	-2.3
Other services	4.0	1.7	-2.3
Manufacturing	2.3	0.0	-2.2
Retail trade	3.3	1.3	-2.0
Health care and social assistance	2.2	0.3	-1.9
Transport, postal, and warehousing	2.6	1.1	-1.5
Rental, hiring, and real estate services	1.0	-0.2	-1.3
Professional, scientific, and tech. services	2.7	1.6	-1.1
Arts and recreation services	0.3	-0.3	-0.6
Construction	1.1	0.5	-0.6
Agriculture, forestry, and fishing	2.1	1.5	-0.6
Administrative and support services	1.1	0.9	-0.2
Wholesale trade	1.6	1.6	-0.1
Financial and insurance services	4.1	4.5	0.4
Education and training	1.3	1.8	0.5
Mining	1.3	2.3	1.0

Sources: Stats NZ and IMF staff calculation.

⁴ See Conway (2016) for an international comparison.

C. Lessons from Previous Recessions in Advanced Economies

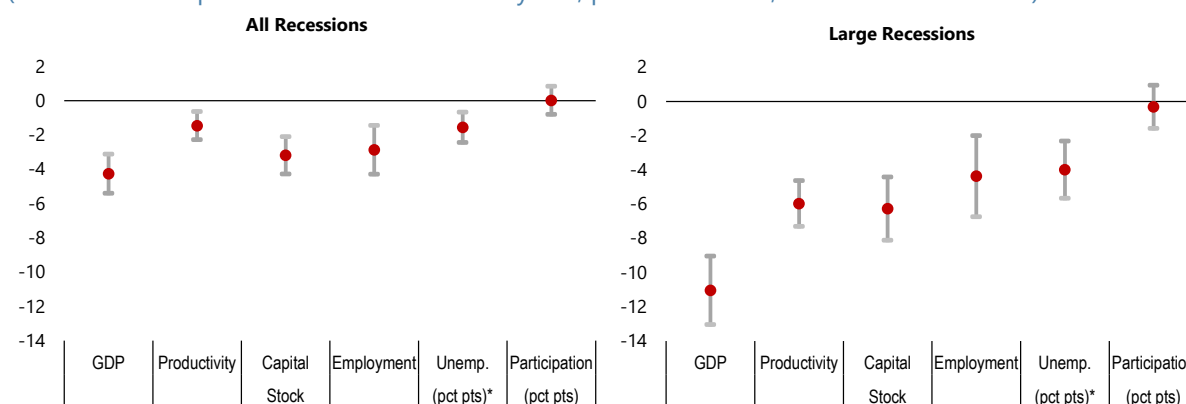
5. This section analyzes the experience of advanced economies in past recessions to provide some historical context to the possible medium-term effects of the COVID crisis.

While the current global recession is undoubtedly unique in its characteristics, analysis of previous recessions can provide useful reference points. We examine whether GDP losses during recessions tend to be permanent or whether output losses are recouped after the end of the recession. In addition, the medium-term dynamics of the output components (labor, capital stock, and productivity) are also studied.⁵

6. Past recessions in advanced economies have had long-lasting effects. An analysis of previous recessions suggests persistent effects on medium-term output, and the persistent decline is driven by a productivity slowdown and reduced capital accumulation and labor input. On average, medium-term output remains 4½ percent below its pre-recession trend after the crisis. For large recessions, which (unlike the COVID-19 shock in New Zealand) often accompany financial crises, the impacts are much larger, with output remaining 11 percent below compared to pre-recession trends. Total factor productivity (TFP) is almost 6 percent below trend, and the capital stock is about 7 percent below trend in this case.

7. New Zealand also suffered from scarring after recessions. Like many advanced economies, New Zealand's growth trend was severely affected by the global financial crisis, and output did not return to its pre-crisis trend, even after several years, with output per capita remaining nearly 20 percent below the pre-GFC trend by end-2019.⁶ Slower capital accumulation, shorter hours worked, and weaker productivity growth contributed to the loss in medium-term output (Lienert and Gillmore, 2015).

Recessions Have a Long-Lasting Impact on Output, Productivity, Capital Stock, and Employment (Deviation from pre-recession trend after 5 years, percent decline, advanced economies)



Note: Error bands indicate 90 percentile confidence interval. Recessions are identified by Martin and others (2015). Recessions are considered as large if they are in the top quartile (peak-to-trough GDP decline above 4.25 percent). Source: Bannister and others (2020).

⁵ We use a standard cross-country local projection model with recession dummies taken from Martin and others (2015). The sample covers the period from 1970 to 2017. See Bannister and others (2020) for methodological detail.

⁶ Pre-GFC trend is calculated as the average per capita growth over 1992-2007. Using OECD Economic Outlook data, Ball (2014) calculated that projected potential output loss in New Zealand in 2015 due to the global financial crisis was about 7½ percent.

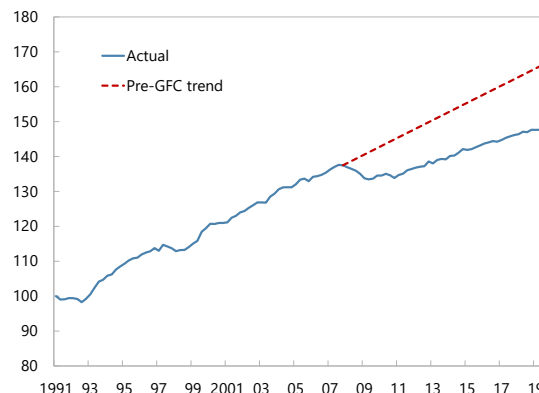
D. Impact of the Pandemic on New Zealand's Medium-Term Output

8. The pandemic is expected to have a sizable impact on New Zealand's medium-term output. Although GDP rebounded strongly in the second half of 2020 after a sharp decline in the first half, supported by strong pent-up demand, the pandemic and the continued border closure are expected to have a medium-term impact on output. The pandemic is likely to adversely affect all main drivers of potential output, including labor inputs, capital accumulation, and productivity growth, with the largest effect likely stemming from reduced inward migration amid the border closure.

9. Lower migration and, to a smaller extent, higher structural unemployment will reduce labor input. Working age population growth is likely to slow significantly, due to reduced net migration as a result of the border closure. Net migration, which accounted for about 70 percent of working age population growth before the border closure, declined sharply and is expected to remain low while border restrictions are in place, contributing to potential output losses by 1.5 percentage point in the medium-term. In addition, the natural rate of unemployment (NAIRU) is expected to increase as a result of skill mismatches induced by uneven sector-level adjustments, which is expected to contribute 0.1 percentage point to the potential output losses in the medium term.⁷ In total, reduced labor input is expected to contribute to the potential output loss by 1.6 percentage points in the medium term.⁸

New Zealand's Growth Trend Has Curved After the GFC

(Log real GDP per capita, 1991Q1=100)

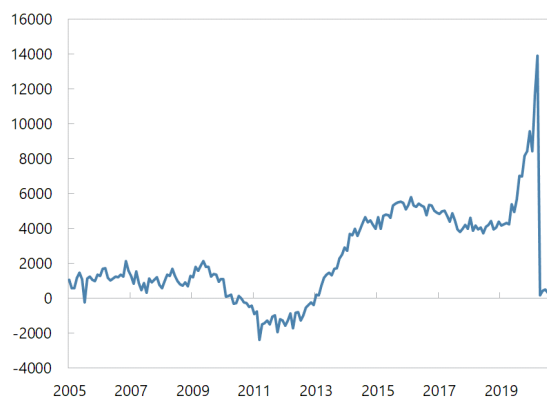


Note: Pre-COVID trend is based on average growth rates over 1992-2007.

Sources: Statistics New Zealand and IMF staff calculations.

Net Migration Dropped sharply After the Border Closure

(Net migration, persons per month)



Source: Stats NZ

⁷ The impact of skill mismatch on NAIRU is estimated by analyzing the relationship between the sectoral reallocation observed in the stock market and sectoral unemployment (see Bannister and others (2020) for detail). Compared to Bannister and others (2020), the medium-term impact from increased NAIRU is expected to be smaller, as the persistence of sectoral reallocation is assumed to be lower.

⁸ This is based on the assumption that net migration will remain below pre-COVID trend (approximated by the average over 2015-19) over 2021-23, by 90 percent in 2021, by 37 percent in 2022, and by 12 percent in 2023, before reaching to pre-COVID level in 2024.

10. Productivity within sectors is expected to slow down, partially offset by the reallocation of workers to more productive sectors.⁹ Internationally, productivity growth tends to slow after recessions. While the trajectory of productivity in this recession remains uncertain, the expected shortage of skilled workers caused by muted migration is likely to adversely affect productivity trends within sectors. Although this slowdown is likely to be partially offset by the shift of workers out of less productive service sectors, on net, aggregate productivity is expected to slow down, which will contribute to the loss of potential output by 0.8 percentage point.¹⁰

11. As in previous recessions in advanced economies, capital accumulation is expected to be slow. In previous recessions in advanced economies, the slowdown of capital accumulation has played a central role in output losses. In the longer run, capital accumulation in New Zealand is expected to follow an endogenous balanced growth path, where capital accumulation is determined by growth in productivity and labor input. Thus, it is expected that trend capital accumulation will decline due to reduced labor supply and weaker productivity growth. In addition, heightened uncertainty will adversely affect firms' investment behavior. In total, the slowdown in capital accumulation is expected to contribute to the potential output loss by 1.3 percentage points.

12. Taken together, potential output is likely to remain below the pre-COVID trend in the medium term. Although the impact on medium-term potential output is somewhat smaller than previously estimated, the pandemic is expected to have a lasting impact on potential output, with potential output remaining about 3¾ percent below pre-COVID trend by 2026. The medium-term impact is driven by reduced labor input, weaker capital accumulation, and reduced productivity growth.¹¹

13. Given uncertainty around the baseline, alternative scenarios are analyzed. There is high uncertainty about the trajectory of the medium-term growth trend. To analyze the possible growth trajectory under different assumptions, both upside and downside scenarios are analyzed, focused on uncertainty related to productivity.

- In the upside scenario, the pandemic will induce firms' efforts to adopt new technologies, including information and communication technology (ICT) investment, which would boost productivity in the medium term. Under this scenario, a shift to a more productive, digitalized economy will fully offset the slowdown in productivity growth within sectors, and there will be moderate within-sector productivity gains (about 0.5 percent) in the medium term.

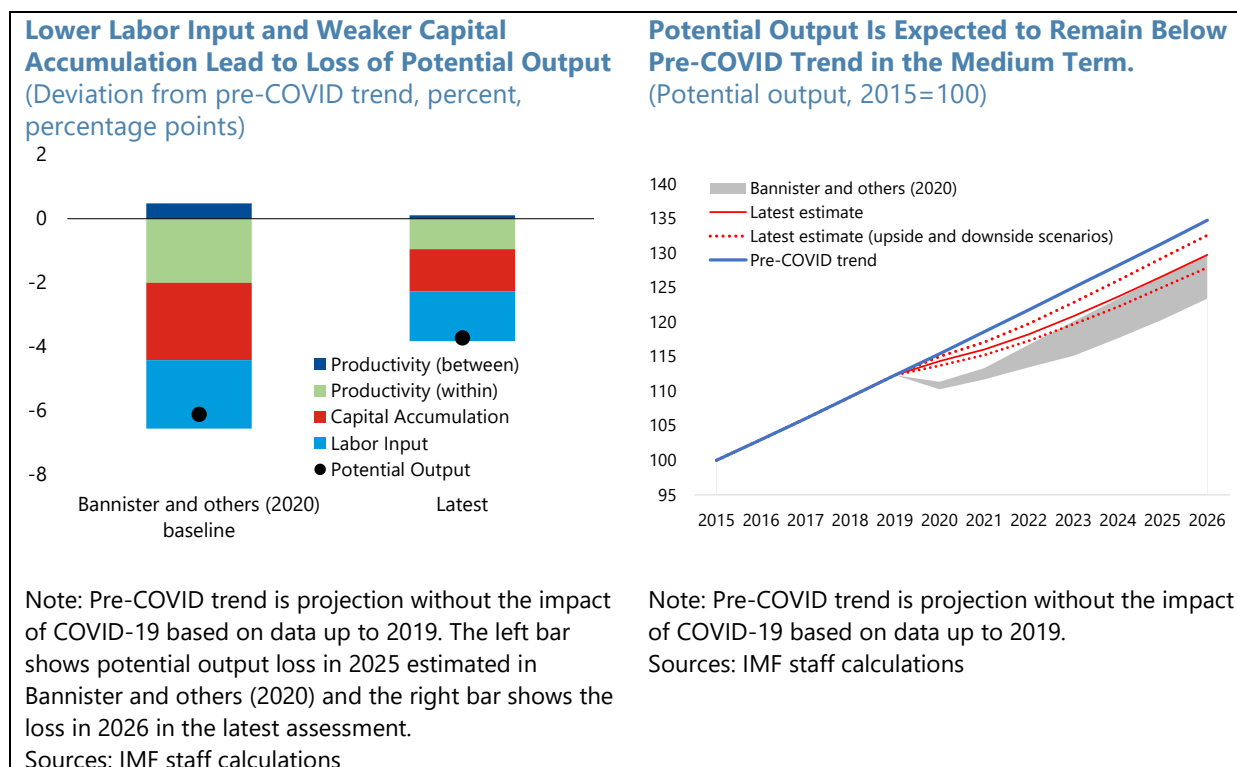
⁹ The impact of sectoral reallocation can be different from previous patterns (e.g. Meehan, 2014) as, unlike other recessions, less productive sectors have been affected more severely in this recession. That said, the impact from sectoral reallocation in the medium term is expected to be smaller than what is assumed in Bannister and others (2020), as persistence of sectoral reallocation is likely to be lower than previously anticipated.

¹⁰ With cross-country evidence, IMF (2020) finds that migration is positively associated with productivity growth. However, Fry and Wilson (2020) argue that the impact of migration on productivity in New Zealand is limited. Productivity slowdown assumed in the baseline is somewhat smaller than the what was observed in previous recessions in advanced economies (discussed in Section C).

¹¹ In labor productivity terms, potential level is expected to remain about 1.1 percent below the pre-COVID trend in the medium term.

- In the downside scenario, weaker productivity spillovers from other advanced economies and lost innovation due to muted migration and subdued innovative investment will result in even more sluggish productivity growth.¹² Under this scenario, slowdown in productivity within sectors will be about twice larger than the baseline scenario.

14. The alternative scenarios illustrate uncertainty around the baseline projection. Under the downside scenario, potential output for New Zealand in 2026 will remain well below pre-COVID trends and the baseline projection, with potential output five percent lower than pre-COVID trends. Under the upside scenario, the loss of potential output is estimated to be smaller than the baseline projection, with potential output 1½ percent lower than pre-COVID trends.¹³



E. Policy Options to Address the Medium-Term Fallout of the Pandemic

15. Strong policy support and structural reforms are key to lift medium-term potential output. First and foremost, maintaining adequate levels of fiscal and monetary policy stimulus until the handoff from public to private demand is firmly entrenched will be important to mitigate output losses, limit scarring, and render the economic recovery durable. In addition, New Zealand should

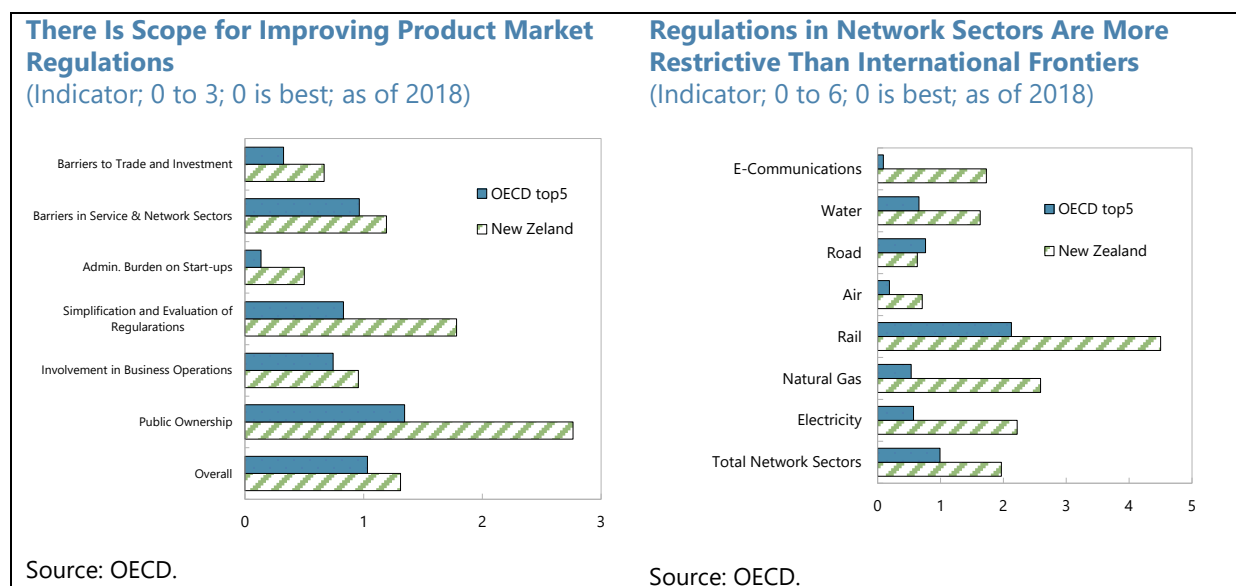
¹² IMF (2020) finds that a one percent decrease in the migration-to-employment ratio would lead to 0.6 percent lower total factor productivity after five years, which is somewhat larger than what is incorporated in the baseline case.

¹³ Labor productivity will be 1.0 percent higher than the pre-COVID trend under the upside scenario and will be 1.5 percent lower than the pre-COVID trend under the downside scenario. See Bannister and others (2020) for other possible upside and downside risks, including stronger migration after border reopening and lower labor force participation rate. Sense Partners (2020) analyzes the possible medium-term impacts on output under resurgence scenarios.

embark on structural reforms to lift the economy's medium-term growth potential. As reforms typically take significant time to take hold, the time to start is now to support medium-term growth and living standards. While the overall institutional structure of New Zealand is well designed and the country performs well among advanced economies in many factors of competitiveness and business regulation, there are some areas that the country can improve to render its growth trend more durable.

16. Productivity. Weak productivity growth has been a long-standing issue. To support productivity growth, New Zealand should relax product market regulations, improve its insolvency framework, scale up innovative investment, and promote high quality foreign direct investment.

- **Product market regulations.** The literature points to positive effects of product market reforms on output and productivity, especially in the medium term (Bourlès and others, 2013 and IMF, 2016). While generally performing well in international comparison, New Zealand's product market regulations are more restrictive in some areas and upstream network sectors, suggesting that there is a scope for improvements, such as streamlining administration burdens and simplifying regulations.¹⁴ Where state ownership is inefficient, reducing public ownership or efforts to improve state-owned enterprises are needed.¹⁵ Pro-competitive reforms would encourage firms' innovation and investment, thereby supporting medium-term potential output.



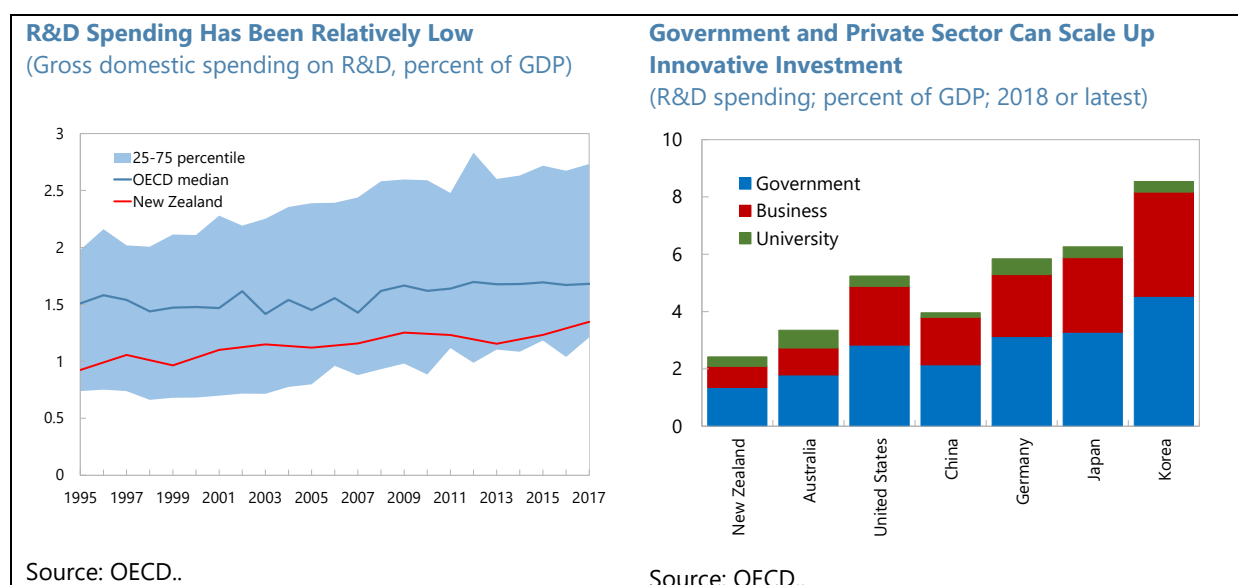
- **Insolvency framework.** Improving the insolvency regime would facilitate the reallocation of resources, thereby lifting productivity (McGowan and others. 2017). International structural

¹⁴ The observation on product market regulations relies on the Indicators of Product Market Regulation compiled by the OECD based on a questionnaire to national authorities. It should be noted that this cross-country database may not necessarily capture factors specific to New Zealand.

¹⁵ New Zealand Productivity Commission (2018) argues that state-sector productivity in New Zealand is persistently low compared to the private sector. Chan and others (2018) report that state ownership is associated with labor intensity in New Zealand, which implies that state-owned enterprises on average experience excessive employment compared to private firms. They also find state ownership is negatively associated with firm profitability.

indicators point to room for improvement in New Zealand's insolvency framework.¹⁶ Compared to some advanced economies (for example, Ireland), it takes longer to resolve an insolvency case (World Bank 2020). The cost of the proceedings, such as attorney's fees and receiver's remuneration, tends to be more expensive than in some other advanced economies. Procedures tailored to SMEs would expedite the restructuring processes.

- Innovative investment.** R&D spending is associated with higher productivity, especially in high-tech sectors (Griliches, 1979 and Ortega-Argilès and others, 2010). New Zealand's spending on R&D has been low compared to peer advanced economies, both in government and business spending. As intangible investment such as R&D is more susceptible to uncertainty, strong policy support is needed to boost private innovative investment under an environment with elevated uncertainty (Czarnitzki and Toole, 2011). New Zealand can scale up government spending on R&D and expand innovative capacities of Crown Research Institutes. Global collaboration would help technology diffusion. In addition, the R&D tax credit scheme, introduced in FY2020 to boost private sector innovative investment, can be expanded further.¹⁷



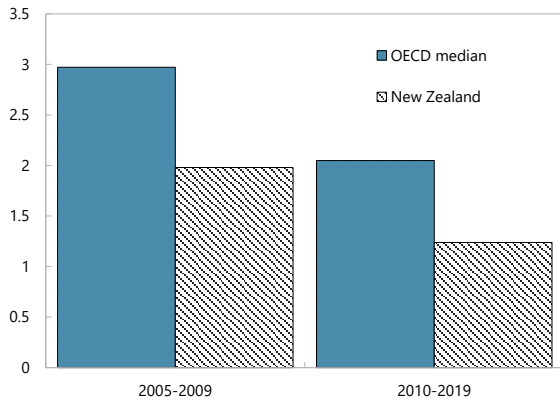
- FDI and connectivity with the global market.** Weak connectivity with the global market is often regarded as one of the factors contributing to weak productivity performance in New Zealand (e.g. New Zealand Productivity Commission, 2021). The literature finds that FDI can bring positive productivity spillover effects (Javorcik 2004, Haskel and others, 2007). FDI in New Zealand has been low compared to peer advanced economies. The ongoing reform of the

¹⁶ New Zealand's insolvency regulatory framework is ranked relatively low among advanced economies in the World Economic Forum's Global Competitiveness Report. New Zealand's performance scores close to the OECD average according to the OECD indicator of the efficiency of insolvency regimes.

¹⁷ See IMF (2016) for fiscal policies to boost innovative investment.

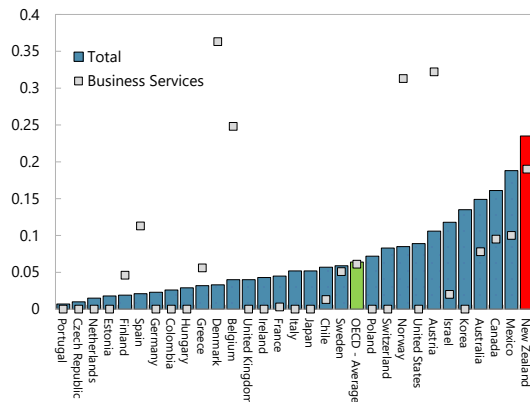
Overseas Investment Act should focus on promoting FDI by reducing FDI-related regulation, which has been relatively restrictive.¹⁸

FDI in New Zealand Has Been Relatively Low
(Inward FDI, percent of GDP)



Source: OECD.

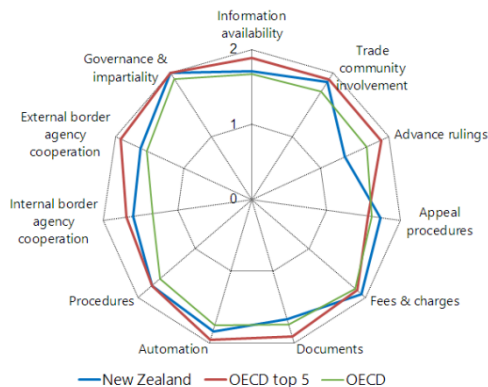
FDI Regulations in New Zealand Are Restrictive
(Indicator; 0 is open; 1 is closed; as of 2019)



Source: OECD.

- Trade facilitation.** Trade can promote knowledge spillover and improve firms through exposure to global competition (Madsen, 2007). Although New Zealand’s trade facilitation performance is already strong in some areas, the economy would benefit from further improving in some areas to close gaps with the international frontier, including advance ruling; automation, such as electronic signature; information availability, such as customs hotlines; and external border agency cooperation. The time and costs associated with the logistical process of exporting and importing goods could be reduced.

There Is Scope for Improving Trade Facilitation
(Trade facilitation index, 0 to 2, 2 is best)



Source: OECD.

Costs Associated With Trade Are Relatively High
(Trading across borders, Doing Business)

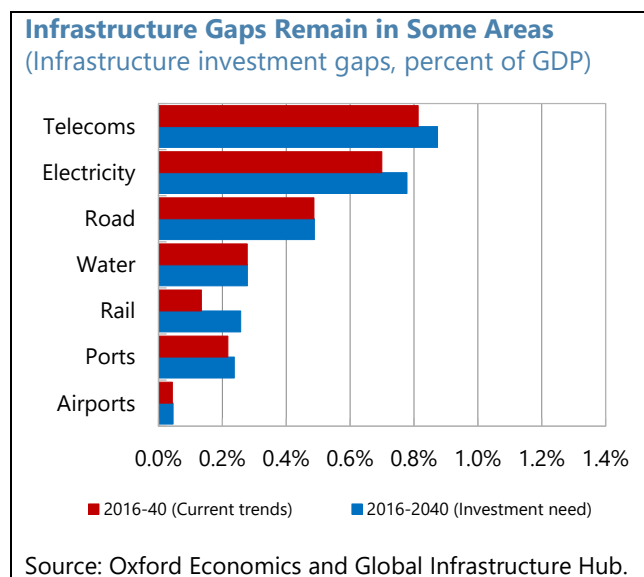
	NZL	OECD high income
Time to export: Border compliance (hrs)	37	12.7
Cost to export: Border compliance (USD)	337	136.8
Time to export: Documentary compliance (hrs)	3	2.3
Cost to export: Documentary compliance (USD)	67	33.4
Time to import: Border compliance (hrs)	25	8.5
Cost to import: Border compliance (USD)	367	98.1
Time to import: Documentary compliance (hrs)	1	3.4
Cost to import: Documentary compliance (USD)	80	23.5

Source: Doing Business 2020.

¹⁸ The ongoing reform aims to improve screening processes, possibly by simplifying requirements and narrowing the criteria used, while maintaining control to sensitive areas. The new national interest test should be used sparingly to avoid the potential impact on high quality FDI.

17. Capital accumulation. To promote capital accumulation, New Zealand should scale up infrastructure investment, encourage FDI, and incentivize business investment.

- **Infrastructure gap.** The government should focus on closing infrastructure gaps in areas such as telecommunications, electricity, and transportation.¹⁹ The planned increase in infrastructure investment is a welcome development, and the New Zealand Infrastructure Commission can play a central role in planning and pipeline management.²⁰
- **Business investment and financial policies.** Firm-level analysis suggests that financial variables such as cash flow and uncertainty play an important role in firms' investment decisions (Annex I).²¹ The government's policies to aid business cash flow, such as the business tax loss carry-back scheme, Small Business Cash Flow Scheme, and Business Finance Guarantee Scheme are appropriate and can be scaled up if downside risks materialize. Product market reforms would also boost business investment through promoting competition (Annex II).



¹⁹ The infrastructure spending gap is estimated to be between 8 and 23 percent of GDP.

²⁰ Infrastructure investment would also reduce regional dispersion in New Zealand. See Muir (2018) for discussion.

²¹ A similar pattern is found in other advanced economies (IMF, 2015). For New Zealand, at the aggregate level, Ratcliffe and Tong (2021) find that uncertainty and financial conditions exert significant influence on business investment. However, at the micro level, employing an Euler-equation model, Nolan and Nolan (2021) argue that the impact of cashflow on investment is insignificant.

Financial Conditions and Uncertainty Affect Firms' Investment Behavior

(Firm-level determinants of investment, NZ)

Dependent Variable:

Investment-to-Lagged Capital

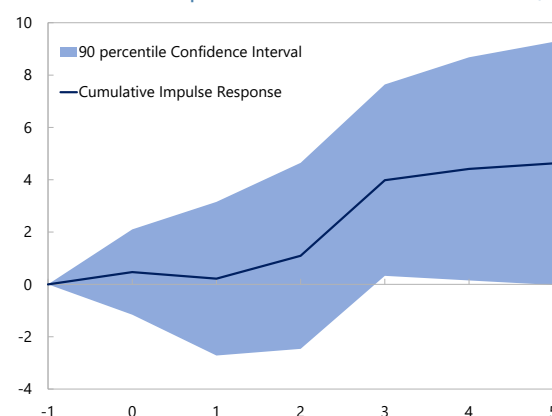
Cost of Debt (-1)	-0.124 (0.171)
Debt (-1)	-0.157*** (0.046)
Liquidity (-1)	0.013* (0.007)
Uncertainty (-1)	-0.069*** (0.034)
Tobin's Q (-1)	0.044*** (0.007)
R-squared	0.058
Sample Period	1990-2019
Number of Observation	1,443

Note: *** and * indicates significance at 1 percent and 10 percent, respectively.

Source: IMF staff calculations.

Product Market Reforms Would Boost Investment

(Responses of business investment to product market reforms, percent, advanced economies)



Source: IMF staff calculations.

18. Labor market. As sectoral reallocation induced by the pandemic is likely to lead to a skill mismatch in the labor market, the government should focus on policies to facilitate sectoral reallocation. The authorities should support workers severely affected by the pandemic, including youth, to minimize scarring and promote long-term human capital accumulation. The government policy agenda, transitioning from wage subsidies to active labor market policies such as training and targeted hiring subsidies, will appropriately support reallocation of labor in the medium-term. The scale and scope of active labor market policies can be further expanded, as spending in this area has been relatively low in New Zealand in international comparison.²²

²² Wage subsidies played an important role in cushioning the economic impact of the lockdowns but could delay reallocation of workers if they were provided for an extended period. In that respect, the authorities' shift from wage subsidies to active labor market policies is welcome. See Chapter 1 for a broader discussion of labor market policies.

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Annex I. Firm-Level Determinants of Business Investment

For the firm-level analysis of business investment in Section E, the following panel regression model, a Tobin's Q model augmented with firm-level financial variables and uncertainty, is employed:

$$\frac{I_{i,t}}{K_{i,t-1}} = \alpha + \tau_i + \delta_t + \beta X_{i,t} + \varepsilon_{i,t}$$

where $I_{i,t}$ denotes firm i 's capital expenditure at time t , $K_{i,t-1}$ denotes firm i 's capital stock, and $X_{i,t}$ includes a set of firm-level variables. $X_{i,t}$ includes the debt level (debt-to-asset ratio), firm-level uncertainty (measured as firm-level stock volatility), the cost of debt (interest rate expenditure-to-debt), liquidity (current-asset-to-current-liability ratio), and Tobin's Q (measured as the sum of market value of equity and book value debt divided by book value of asset).¹ The regression includes firm-level and time fixed effects, and firm-clustered robust standard errors are estimated. All explanatory variables are included with a one-year lag to preempt endogeneity issues. Firm-level data are an unbalanced panel at annual frequency, with total observation of 1,443 over 1990-2019, obtained from the IMF Corporate Vulnerability Unit Database, which is based on the Worldscope database. Firms in the financial sector are excluded from the sample. Estimated parameters are reported in Section E.

¹ The specification here is similar to that in IMF (2015). The other possible approaches include adding the lagged dependent variable to the equation, but it is not considered in this exercise as the specification will cause Nickell bias and the generalized method of moments (GMM) has poor small sample properties.

Annex II. The Effect of Product Market Reforms on Business Investment

Section E reports the effect of product market reforms on business investment. To analyze the impact of product market reforms, a panel local projection model focused on advanced economies is employed following IMF (2016):

$$I_{i,t+k} - I_{i,t-1} = \alpha_i + \gamma_t + \beta_k R_{i,t} + \theta_k X_{i,t} + \varepsilon_{i,t}$$

where $I_{i,t}$ denotes business investment in country i at time t (in logarithms), $R_{i,t}$ denotes a dummy variable for product market reform, which takes a value of 1 in the year(s) when a reform takes place and 0 otherwise. $X_{i,t}$ denotes a set of control variables, including contemporaneous and lagged variables of other structural reforms (such as reforms of unemployment benefits and employment protections), lagged product market reform dummies, and crisis event dummies. The definition of product market reform events follows IMF (2016), which identifies reform events based on OECD Economic Surveys and country-specific sources. The data covers a sample of 18 advanced economies from 1990 to 2016. In the panel regression, both country fixed effects and year fixed effects are included. Clustered robust standard errors are estimated.