

Vaccinating the Economy Against Covid-19: *Ex Post* Revenue Insurance for Firms and Households to Sustain Economic Confidence and Aggregate Demand

Richard Meade*

Auckland University of Technology & Cognitus Economic Insight

Submitted 28 August 2020, Revised 13 January 2021

Abstract

The Covid-19 pandemic risks causing a major collapse in “economic confidence” – i.e. the beliefs of firms and households that all other firms and households will maintain their economic activity – and hence in aggregate demand. Economic responses like wage subsidies may prove inadequate for sustaining confidence due to their limited scope, and because their high cost makes them unsustainable. An alternative is *ex post* revenue insurance, enabling firms and households to borrow against their own future incomes to top up current pandemic-related income shortfalls. Making such loans repayable through future tax surcharges (along the lines of existing student loans schemes) is administratively feasible, and likely to be both more effective and affordable – and inter-generationally equitable – than existing support measures. Government pre-committing to making such loans available for as long as they are necessary should maintain economic confidence and aggregate demand, minimising the pandemic’s economic harms.

JEL Classifications: E62, E65, H24, H25, G22.

Keywords: Covid-19, Economic Response Measures, Revenue Insurance, Wage Subsidies, Student Loans.

*Full acknowledgments are made at the end of this paper. The views expressed in this paper are those of the author and not of any organisations with which he is affiliated. Any errors or omissions in this paper are his own. Email: richard.meade@cognitus.co.nz.

1 Introduction

The Covid-19 pandemic presents multiple policy challenges. Foremost is protecting vulnerable populations against loss of life, particularly while effective vaccines or treatments are pending. However, the economic costs of both disease outbreaks and pandemic counter-measures cannot be ignored, and policymakers worldwide face the difficult challenge of minimising harms to economies that could have serious implications for future health and well-being.¹

This policy paper aims to diagnose the key economic challenges presented by Covid-19, and assess the efficacy of existing economic responses – taking the need for public health responses as given. It proposes an alternative approach that seeks to maintain “economic confidence” – during a widely-experienced crisis of unknown course and duration – through the use of *ex post* revenue insurance for both households and firms. Such insurance could minimise pandemic-induced falls in aggregate demand and long-term economic harms.

The paper focuses on New Zealand’s economic challenges and responses, and institutions that might support the proposed alternative response. In many cases, however, these are shared with other developed countries, so the policy prescriptions for New Zealand should be more widely applicable.

2 The Problem with Covid-19

Covid-19, and responses thereto, have obvious supply-side impacts. Global supply chains have been upset due to lockdowns, border closures, and disruptions to logistics (e.g. loss of shared air cargo capacity, as passenger air travel has collapsed). Likewise, people-facing enterprises – e.g. hospitality, tourism, education – have struggled to serve clients who are either subject to lockdowns or border restrictions (e.g. international tourists and students), or who voluntarily self-isolate to minimise infection risk.

Unlike natural disasters, productive capacity is not physically impaired. Rather it is impaired in productivity terms by being forced to operate at reduced capacity, in inefficient ways,² or at higher cost.³ A danger is that

¹This highlights possibly subtle, but nonetheless significant, inter-temporal trade-offs in excess mortality – i.e. saving lives now by controlling spread of the virus, but possibly losing lives later through compromising the economy (e.g. reducing resources available to future health systems), when short and sharp elimination strategies are unsuccessful or infeasible.

²For example, due to physical distancing of workers, or increased home-working.

³For example, due to needing to use personal protective equipment (PPE).

short-term crisis – if not adequately addressed – could lead to longer-term capacity loss due to business closures.

Demand-side impacts, however, are likely to be more generally critical.⁴ These include possible collapse in households’ demand for the products and services supplied by firms, and also in firms’ demand for productive inputs – notably household labour.⁵ This highlights the critical inter-dependency between households and firms – neither can flourish if the other is languishing. Firms rely on households for demand, and households depend on firms for employment income enabling purchases from firms.

At the heart of the pandemic’s economic impacts is the risk it poses to “economic confidence”. I take that to mean the beliefs households and firms form about the likely behaviours of other households and firms in the face of the pandemic. How those beliefs are formed is critically affected by the widespread and far-reaching nature of the Covid-19 shock.

While economic recessions commonly affect all households and businesses, Covid-19 hits the confidence of all households and firms – globally – with a *severe* and *highly correlated* economic shock.⁶ It also creates *novel uncertainties*, such as whether or not effective vaccines or treatments will eventuate, how long the disruptions will continue, and how long and how often measures like lockdowns will be required.⁷

When households and firms form beliefs about *other* households’ and firms’ likely behaviours, the pandemic presents a coordination problem similar to a prisoner’s dilemma. If all such agents continue as much as possible to engage in economic exchange (i.e. buying and selling firm outputs and productive inputs), the decline in aggregate demand can be minimised. That way business failures and worker layoffs can be kept in check, and subsequent rounds of cascading failures and layoffs limited.

Conversely, if agents conclude that others will react cautiously to the pandemic, with firms laying off workers and households limiting expenditures,

⁴Independently of Meade (2020), Milne (2020) argues likewise – thanks to Arthur Grimes for alerting the author to Milne’s work. Milne also distinguishes the current crisis from the Global Financial Crisis (GFC), which presented the risk of financial sector crisis being transmitted to the real economy. Here the likely transmission path is in the opposite direction.

⁵To these might be added the impact on firms’ demand for the outputs of other firms. Ultimately, however, all firms’ demand hinges on there being demand from some “final consumer”, which significantly includes households.

⁶For policy purposes, it is also relevant that the pandemic is not of firms’ and households’ making, and has potentially been exacerbated by public health responses (however necessary). This reduces concerns about culpability, which can shape how policy responses are targeted.

⁷In many ways, this creates uncertainties akin to those of world war.

they face incentives to do likewise (rather than be the only firm or household left trading as normal when others have “run to the hills”). However, if all agents behave this way, economic decline is exacerbated. To minimise the pandemic’s economic harms, it is therefore necessary that households and firms believe that other agents will weather the economic storm. That way they each have the confidence to behave in a way that reinforces other agents behaving likewise.

3 The Problem with Existing Covid-19 Economic Response Measures

New Zealand, like many countries, has focused on preserving employment, and cushioning shocks to businesses (especially SMEs).⁸

Wage subsidies have been widely used to preserve jobs. They support employers so that at least some of their wage-related costs can be covered while revenues have plummeted or vanished. In New Zealand, they have been set high enough to cover the wages of lesser-skilled workers, but certainly not all the costs of skilled workers.⁹

Successive subsidy rounds have become shorter, and with stricter qualifying criteria.¹⁰ Government has also signalled that such measures will be decreasing, due to their high fiscal cost. This is despite a renewed outbreak of the virus in New Zealand’s largest city, Auckland, resulting in further – and repeatedly extended – lockdowns, reinforcing to firms and households alike that the pandemic’s impacts will likely continue but be hard to predict.¹¹

The expectation of policymakers appears to have been that employers (i.e. firms’ shareholders) will draw on their resources to insure employees’ revenues not covered by wage subsidies.¹² This is at a time when those shareholders continue to bear other fixed costs – e.g. rent, rates, insurances, utilities, etc – and face substantial uncertainty about their businesses’ viability.¹³

⁸Larger enterprises can be better-placed than SMEs to access capital markets for necessary financial buffers, or to negotiate bespoke support measures with government (e.g. national airlines).

⁹Details of New Zealand’s initial wage subsidy can be found at: <https://www.workandincome.govt.nz/covid-19/wage-subsidy/index.html>.

¹⁰For details of New Zealand’s wage subsidy extension, see: <https://www.workandincome.govt.nz/covid-19/wage-subsidy-extension/index.html>.

¹¹The New Zealand prime minister was publicly reported as having ruled out wage subsidy extensions prior to this renewed outbreak (Stuff (2020)).

¹²Likewise, there has been a presumption that landlords should at least partially insure tenants against lost revenues by agreeing to rent holidays or reductions.

¹³This is not least because their own viability hinges on how the rest of the economy –

Since many business costs are fixed, only small revenue declines are required before firms become unprofitable. Also, as shareholders' resources decline with successive lockdowns, and firms' viability becomes increasingly doubtful, it is questionable whether (and why) they will continue to insulate their employees against the pandemic, and not just cease trading. Ultimately, the only way to protect jobs is to preserve the viability of the enterprises providing them.

Wage subsidies have been complemented with measures like mortgage holidays,¹⁴ government guarantees of 80% of default risk for bank lending to businesses,¹⁵ and government loans to small businesses.¹⁶ However, leaving banks with even just 20% default risk in the midst of a major global economic crisis is likely sufficient to render such lending unattractive.

Small business loans by government should be more viable, but are capped at low levels (related to number of employees rather than revenue declines), limiting their effectiveness. More fundamentally, any firm contemplating borrowing to weather the Covid-19 storm will struggle to gauge whether they will be able to repay them, given they have fixed repayment dates and the economy's prospects remain highly uncertain.

By contrast, mortgage holidays offer a material financial cushion to borrower households. However, uncertainty as to how long they might be available is a material risk to their ongoing effectiveness.

In short, existing measures such as these are unlikely to be effective for two key reasons. First, signalling that wage subsidies will become less generous as the pandemic lingers provides precisely the opposite signal to that needed by households and firms to believe all other households and firms will continue to benefit from such subsidies. Secondly, due to prohibitive qualifying criteria or inadequate reach, support measures like these more generally will not reassure households and firms that other agents will benefit from them. The prisoner's dilemma remains.

indeed, the world economy – will also fare.

¹⁴Supported by regulatory accommodation by New Zealand's central bank, the Reserve Bank of New Zealand. Details of New Zealand's initial mortgage holiday scheme can be found at: <https://www.beehive.govt.nz/release/mortgage-holiday-and-business-finance-support-schemes-cushion-covid-impacts>.

¹⁵Details of New Zealand's Business Finance Guarantee Scheme (BFGS) can be found at: <https://www.treasury.govt.nz/information-and-services/new-zealand-economy/covid-19-economic-response/asures/bfg>.

¹⁶Details of New Zealand's Small Business Cashflow Loan Scheme (SBCS) can be found at: <https://www.ird.govt.nz/covid-19/business-and-organisations/small-business-cash-flow-loan>.

4 An Alternative Proposal Modelled on the Student Loans Scheme

To reassure firms and households that their counterparts have access to the economic lifeline needed to support their ongoing financial viability, two ingredients are key. The first is the use of measures capable of avoiding financial distress. The second is a *pre-signalled commitment* to making such measures available for so long as they are needed.¹⁷

As to the first ingredient, existing measures fail due to their limited scope and scale. In short, instead of measures that insure firms and households against being unable to meet just some of selected outgoings (e.g. wage costs for businesses), *ex post* revenue insurance is required. That insurance should be available up to the level of pre-pandemic revenues, and available to both firms and households that do not already enjoy insured incomes.¹⁸ With such access, all such agents can be confident that all others can sustain their expenditures and meet their financial obligations, and bespoke regimes for individual expenditures (wages, mortgages, rents, etc) are unnecessary.

This insurance could take the form of loans akin to New Zealand’s student loans, perhaps interest-free for so long as the pandemic continues.¹⁹ Repayments would be made only once certain income thresholds are reached, by way of a (progressive) tax surcharge for agents taking out loans.

Unlike existing loan measures, these “soft” repayment terms make such loans more tenable for borrowers, since they do not need to assess whether they can meet fixed repayment obligations. Instead, they only repay loans as and when they prove able to. Importantly, by government pre-committing to such a mechanism, economic confidence is supported, reducing the need to access such loans in the first place.²⁰

Firms that access such loans might be obliged to insure at least some of their employees’ wages, if only to avoid all firms having an incentive to lay off easier-to-replace workers in the expectation of rehiring them post-recovery.

¹⁷Akin to the famous “whatever it takes ...” speech given in 2015 by the former European Central Bank chief, Mario Draghi, credited with helping to turn the tide on the financial crisis engulfing the Eurozone following the GFC and Greek financial crisis. See Bloomberg (2018).

¹⁸For example, welfare beneficiaries and superannuitants, and state employees. As above, larger firms should also be excluded, unless they can demonstrate obstacles to securing their own solutions.

¹⁹Scheme duration could be tied to the ongoing use of pandemic alert levels above a certain threshold.

²⁰Contrast this with a “wait and see” or “ambulance at the bottom of the cliff” approach, which could be more costly because it tries to ameliorate, rather than avoid, a fall in confidence.

Failing to do so could mean such workers needing to disproportionately rely on household borrowings. That could raise equity issues, but could also mean that all firms face reduced demand from such workers if they all lay them off (another possible prisoner's dilemma).

A benefit of using a student-loans like scheme is that New Zealand's tax authority, Inland Revenue Department (IRD), already has records of pre-pandemic revenues, and has infrastructure to administer the scheme. Loans could be made available in tranches (e.g. for up to three months' income at a time) to minimise excessive borrowing, especially by households. Non-repayment of loans would be minimised by making household loans the personal liabilities of borrowers,²¹ and business loans the liabilities of shareholders,²² to avoid voluntary liquidations to avoid repayment. Withholding tax mechanisms – also already administered by IRD – could assist in avoiding non-repayment if borrowers become non-resident.

Such loans enable households to smooth their lifetime consumption in the face of an unexpected and substantial shock, letting them borrow against their own future incomes. This fills a gap in capital markets,²³ is inter-generationally more equitable than deficit-funded dollar-for-dollar wage subsidies, and can be rolled out at much larger scale since borrowers are leveraging any government subsidies against their own future resources.²⁴ The loans also recruit borrowers to use their private information regarding revenue requirements and spending priorities to determine who should access how much support.²⁵

By enabling households to make up pandemic-related income shortfalls through such *ex post* revenue insurance, moral hazards arguably arise. For example, agents may be tempted to take inadequate measures against subsequent pandemics. However, the unprecedented nature of the pandemic should militate against this. In any case, it would likely be more efficient for governments to strengthen pandemic detection, containment and treatment options than for households and firms to self-insure against future pandemics.

²¹For example, being repayable from their estate if they die with a balance outstanding. This differs from New Zealand's existing student loans scheme, which forgives loans upon death. Making pandemic-related household loans repayable out of estates is likely to be more appropriate due to pandemic-related mortality risk, and more pervasive moral hazards if all households can access such loans but avoid them upon death.

²²For example, by deeming business loans to be unpaid shares, not subject to limited liability.

²³Due to prohibitions on slavery, making it difficult for lenders to secure loans against future income.

²⁴This makes the scheme more affordable to government, and thus sustainable for longer.

²⁵Incentive compatibility is enhanced because any borrower is making a choice to personally pay higher taxes if they make use of the loans.

5 Illustrative Quantification, and Comparison with Features of Other Schemes

To illustrate the possible order of magnitude of this paper’s proposal, its level of coverage and associated changes in public and private sector net liabilities are compared with those of the New Zealand wage subsidy, and Small Business Cashflow Loan Scheme (SBCS).²⁶ Attention is restricted to the year ended 30 June 2020, which takes in the strict nationwide lockdown that was in place from 25 March to 26 April, and coincides with the period in which the most jobs were covered by the initial wage subsidy.²⁷

To gain a sense of the likely order of magnitude of household loans required under this paper’s proposal, source deductions (mainly “pay as you earn” deductions on wages and salaries) received by the government as tax revenues from individuals were compared using *actual* figures in the Crown Financial Statements for that period (Treasury (2020b), note 4) and their *pre-pandemic forecasts* for the same period made in December 2019 (Treasury (2019, data tables)). The actual figure of NZ\$34.963 billion – which is assumed to include taxes paid on any wage subsidies received – is practically identical to the NZ\$34.96 billion figure forecast in December 2019. Hence the actual level of wage subsidy – NZ\$12.095 billion (Treasury (2020b, note 3)) – is taken to represent a reasonable indication of the level of household loans required over the relevant period.

To gain a sense of the likely order of magnitude of business loans required, the NZ\$21 billion annual decline in aggregate business revenues reported in Reserve Bank of New Zealand (2020, data table for Figure 2.4) is adopted.²⁸

In comparing the New Zealand government’s actual measures (i.e. the wage subsidy and SBCS) with this paper’s proposed loans, it is important to recognise that the SBCS creates an asset for the government as well as a liability for the private sector firms that make use of it. So too do any household or business loans taken up under this paper’s proposal.²⁹ However,

²⁶When introduced, the SBCS provided small, five-year loans to SMEs, with interest payments suspended for the first year, and waived if the loans were repaid within a year. The New Zealand Business Finance Guarantee Scheme (BFGS) is excluded from this analysis on *de minimis* grounds, due to its limited uptake (Treasury (2020b, note 3)).

²⁷See Figure 2.6 of Reserve Bank of New Zealand (2020).

²⁸This figure is almost the same as the difference between forecast and actual company tax revenues using Treasury (2019) and Treasury (2020b, note 4), scaled up by dividing by the 28% New Zealand company tax rate to estimate assessable profits, and adding the aggregate wage subsidy (the receipt of which would have served to inflate actual company profits and taxes thereon, masking the pandemic’s profit impact). These calculations produce a figure of NZ\$20.3 billion.

²⁹Conversely, wage subsidies and loans to indemnify revenue shortfalls are not treated

while the level of subsidy or loan can be taken to represent the level of revenue indemnity offered, the government's asset value of any loans must be written down from its nominal value to fair value reflecting both any interest subsidy and likely defaults, which are costs to taxpayers at large. Similarly, private sector liabilities for any loans are taken to reflect just their fair value. It is assumed that any subsidies or loans offered by the government are funded by government borrowing.

As at 30 June 2020, NZ\$1.423 billion of SBCS loans had been made, with a fair value of NZ\$0.737 billion (Treasury (2020b, notes 3 and 16)) – implying a fair value write-down of 48%. For illustrative purposes, a 33% write-down is assumed for other loans, based on figures reported for the New Zealand student loans scheme (Ministry of Education (2019, p. 42)).³⁰

Table 1 summarises the resulting level of support (i.e. revenue indemnities) and changes in government and private sector net liabilities. As can be seen, the total level of support differs between approaches (NZ\$13.5 billion for the government measures, and NZ\$33.1 billion for the proposed loans). However, at the aggregate level the total level of support equals the total change in net liabilities under each alternative.

That said, the distribution of net liabilities varies markedly under the different approaches. A wage subsidy leaves private sector balance sheets unchanged, but increases government debt by the amount of the support it offers. Conversely, loans increase government debt by their full value, and private sector debt by their fair value, while offering private sector support equal to their full value.

The main difference between the government measures and the alternative loans proposal is that the latter requires 14% less net government debt (NZ\$10.9 billion vs NZ\$12.8 billion) while offering 145% more – almost 2.5 times greater – support (NZ\$33.1 billion vs NZ\$13.5 billion).³¹ This extra support comes at the cost of higher private sector debt (NZ\$22.1 billion vs NZ\$0.7 billion). But this also means that 67% of the additional debt used to fund the support (NZ\$22.1 billion out of NZ\$33.1 billion) is borne by the beneficiaries of that support, with only 33% borne by taxpayers at large.

as assets of their recipients, since they are intended to make up for those shortfalls.

³⁰This compares with a figure of 34% based on initial SBCS estimates of nominal and fair values in Treasury (2020a).

³¹These figures represent additional nominal government debt, assuming support is debt financed, and compare with outstanding nominal student loans of NZ\$16.034 billion as at 30 June 2019 (Ministry of Education (2019)).

Table 1: Comparing Support Levels and Changes in Net Liabilities for Actual Government Measures, and Alternative Loans Proposal, for Year Ending 30 June 2020 (NZ\$ billion)

	Government			Private Sector			Totals	
	ΔL	ΔA	$\Delta L - \Delta A$	ΔL	ΔA	$\Delta L - \Delta A$	<i>Support</i>	$\Delta L - \Delta A$
Government measures:								
Wage subsidy	12.1	0	12.1	0	0	0	12.1	12.1
SBCS	1.4	0.7	0.7	0.7	0	0.7	1.4	1.4
	13.5	0.7	12.8	0.7	0	0.7	13.5	13.5
Proposed loans:								
Households	12.1	8.1	4.0	8.1	0	8.1	12.1	12.1
Businesses	21.0	14.1	6.9	14.1	0	14.1	21.0	21.0
	33.1	22.1	10.9	22.1	0	22.1	33.1	33.1

Notes: ΔL is change in liabilities, ΔA is change in assets, $\Delta L - \Delta A$ is change in net liabilities. *Support* is nominal value of subsidy or loan.

Conversely, the cost of the NZ\$12.8 billion of additional net government liabilities under the government measures is fully borne by present and future taxpayers, and not in proportion to their level of support received.

In summary, compared with existing government measures, this illustrative analysis suggests the alternative loans proposal is less costly to taxpayers, and offers considerably greater support. At the same time it offers support proportionate to need (i.e. foregone revenue, however great or small that foregone revenue is), while also ensuring that most of the cost of support is borne by those receiving it (instead of taxpayers at large). This suggests it is more efficient, more effective, and more equitable.

Finally, Table 2 compares features of the existing government economic response measures and this paper’s alternative proposal with those of two other prominent New Zealand proposals made during the pandemic. The first, Crampton (2020) is relatively close in spirit to the existing government measures in that it prioritises wage subsidies, but along the lines of the *Kurzarbeit* model adopted in Germany.³² That scheme offers around 67% indemnity to workers for lost wages (Law (2020)). Additionally, Crampton’s approach provides for households being able to borrow up to \$12,000 per annum to make up for pandemic-related income shortfalls, repayable through future tax surcharges for borrowers (Crampton (2020), New Zealand Initiative (2020)). This latter feature means his proposal also shares features with this paper’s, but the level of loans-based revenue indemnity is only c. 20% due to the loan cap,³³ and loans are not proposed for indemnifying business revenue shortfalls.

The second other alternative is that of Reddell (2020). It too shares features with both the existing government measures and this paper’s proposal. It covers both foregone household and business incomes, indemnifying each up to 80% of their pre-pandemic levels by way of direct subsidy. To the extent it offers substantial indemnity in proportion to pre-pandemic revenues, and indemnity for both households and firms, it appears much like this paper’s proposal. However, like existing government measures, it is based on government funding of the support measures, meaning its cost is borne by taxpayers at large. Hence, in contrast to this paper’s proposal, it offers both

³²For a summary of the German scheme, see IMF (2020) or Law (2020).

³³Based on data from NZ.Stat (<http://nzdotstat.stats.govt.nz/wbos>), average (median) weekly wages and salaries in 2020 were NZ\$1,209 (NZ\$1,062), implying average (median) annual wages and salaries of NZ\$62,868 (NZ\$55,224). NZ\$12,000 represents c. 20% of those annual figures.

Table 2: Comparing Features of Actual Government Measures and Alternative Loans Proposal with those of Crampton (2020) and Reddell (2020)

	Actual Measures		Alternative Measures	
	Wage Subsidy & SBCS	Crampton (2020)	Reddell (2020)	This Paper
Indemnity level:				
Wages	c. 50%*	c. 87%**	80%	100%
Business revenues	7% [^]	0%	80%	100%
Taxpayers' indemnity exposure:				
Wages	100%	c. 74% [^]	100%	33% [†]
Business revenues	48% [‡]	n.a.	100%	33% [†]

Notes: * NZ\$585.50 per week wage subsidy / average (median) weekly wages and salaries (see footnote 33);

** 67% *Kurzarbeit*-like wage subsidy + c. 20% indemnity from capped loan; [^] NZ\$1.423 billion SBCS loans / \$21 billion foregone business revenues (see main text); [^] 100% of 67% wage subsidy plus assumed 33% fair value write-down of c. 20% loans (see main text); [†] Assumed fair value write-down (see main text); [‡] Fair value write-down per Treasury (2020b, note 3).

a lower level of support (80% vs 100%), a higher taxpayer burden, and less targeting of support costs to support beneficiaries.

6 Conclusions

Just as developing an effective vaccine to Covid-19 requires identification of its particular characteristics, protecting the economy against the virus also requires a tailored solution. In this case priority should be to minimise loss of economic confidence and decline in aggregate demand, with the most effective solution likely to be *ex post* revenue insurance. Existing measures are too targeted and expensive to achieve this, so an alternative, modelled on the student loans scheme and enabling firms and households to borrow against their own future incomes, has greater prospect of success. Such a measure may become more necessary if the pandemic lingers, successive lockdowns are required, and existing measures prove unsustainable.

Acknowledgments

The author gratefully acknowledges helpful comments and discussions on various iterations of the economic response proposal set out in this paper from/with: the New Zealand Treasury, Reserve Bank of New Zealand, Grattan Institute, Eric Crampton, Arthur Grimes, Michael Reddell, Kathryn Ryan on RNZ National, participants on webinars organised by the Law & Economics Association of New Zealand and Auckland Rotary, and various industry bodies. Helpful suggestions from an anonymous referee have also greatly improved the paper, for which the author is also very grateful.

Disclosures

No funding was received by the author for preparing this paper. No conflicts of interest arise with its writing.

References

- [1] Bloomberg, 2018, *3 Words and \$3 Trillion: The Inside Story of How Mario Draghi Saved the Euro*, 27 November. Available from: <https://www.bloomberg.com/news/features/2018-11-27/3-words-and-3-trillion-the-inside-story-of-how-mario-draghi-saved-the-euro>.

- [2] Crampton, E. and L. Hong, 2020, *Effective Treatment: Public Policy Prescription for a Pandemic*, Research Note, The New Zealand Initiative, 26 March. Available from: <https://www.nzinitiative.org.nz/reports-and-media/reports/research-note-3>.
- [3] IMF, 2020, *Kurzarbeit: Germany's Short-Time Work Benefit*, 15 June. Available from: <https://www.imf.org/en/News/Articles/2020/06/11/na061120-kurzarbeit-germanys-short-time-work-benefit>.
- [4] Law, D., 2020, *Short-Time Work to Maintain Employment*, Policy Point, The New Zealand Initiative, 24 March. Available from: <https://www.nzinitiative.org.nz/reports-and-media/reports/policy-point-short-time-work-to-maintain-employment/>.
- [5] Meade, R., 2020, *Keeping the Economy Going in COVID19 Lockdown – A Proposal for "Low Cost" Generalised Insurance of Business and Household Incomes*, 3 April. Available from: <https://www.cognitus.co.nz/publications>.
- [6] Milne, A., 2020, *A Critical Covid 19 Economic Policy Tool: Retrospective Insurance*, 21 March. Available from: <http://dx.doi.org/10.2139/ssrn.3558667>.
- [7] Ministry of Education, 2019, *Student Loan Scheme Incorporating the Financial Schedules for the Year Ended 30 June 2019*, December. Available from: https://www.educationcounts.govt.nz/publications/series/student_loan_scheme_annual_reports.
- [8] New Zealand Initiative, 2020, *Universal Basic Income (UBI) Not the Solution We Need Right Now*, Media Release, 27 March. Available from: <https://www.nzinitiative.org.nz/reports-and-media/media/media-release-universal-basic-income-ubi-not-the-solution-we-need-right-now/>
- [9] Reddell, M., 2020, *Pandemic Income Insurance*, Blog Post, Croaking Cassandra, 7 September. Available from: <https://croakingcassandra.com/2020/09/07/>.
- [10] Reserve Bank of New Zealand, 2020, *Financial Stability Report*, November. Available from: <https://www.rbnz.govt.nz/financial-stability/financial-stability-report/fsr-nov-2020>.
- [11] Stuff, 2020, *Coronavirus: Government Considers Wage Subsidy for Auckland if Lockdown Persists*, 12 August. Available from: <https://www.stuff.co.nz/economy/125444444/coronavirus-government-considers-wage-subsidy-for-auckland-if-lockdown-persists>.

[//www.stuff.co.nz/national/health/coronavirus/300080094/coronavirus-government-considers-wage-subsidy-for-auckland-if-lockdown-persists](https://www.stuff.co.nz/national/health/coronavirus/300080094/coronavirus-government-considers-wage-subsidy-for-auckland-if-lockdown-persists)

- [12] Treasury, 2019, *Half Year Economic and Fiscal Update 2019*, 11 December. Available from: <https://www.treasury.govt.nz/publications/efu/half-year-economic-and-fiscal-update-2019>.
- [13] Treasury, 2020a, *Addition to the Supplementary Estimates – Vote Revenue*, 16 June. Available from: <https://treasury.govt.nz/sites/default/files/2020-06/suppest20reven-vol2.pdf>.
- [14] Treasury, 2020b, *Financial Statements of the Government of New Zealand for the Year Ended 30 June 2020*, 24 November. Available from: <https://www.treasury.govt.nz/publications/year-end/financial-statements-2020>.