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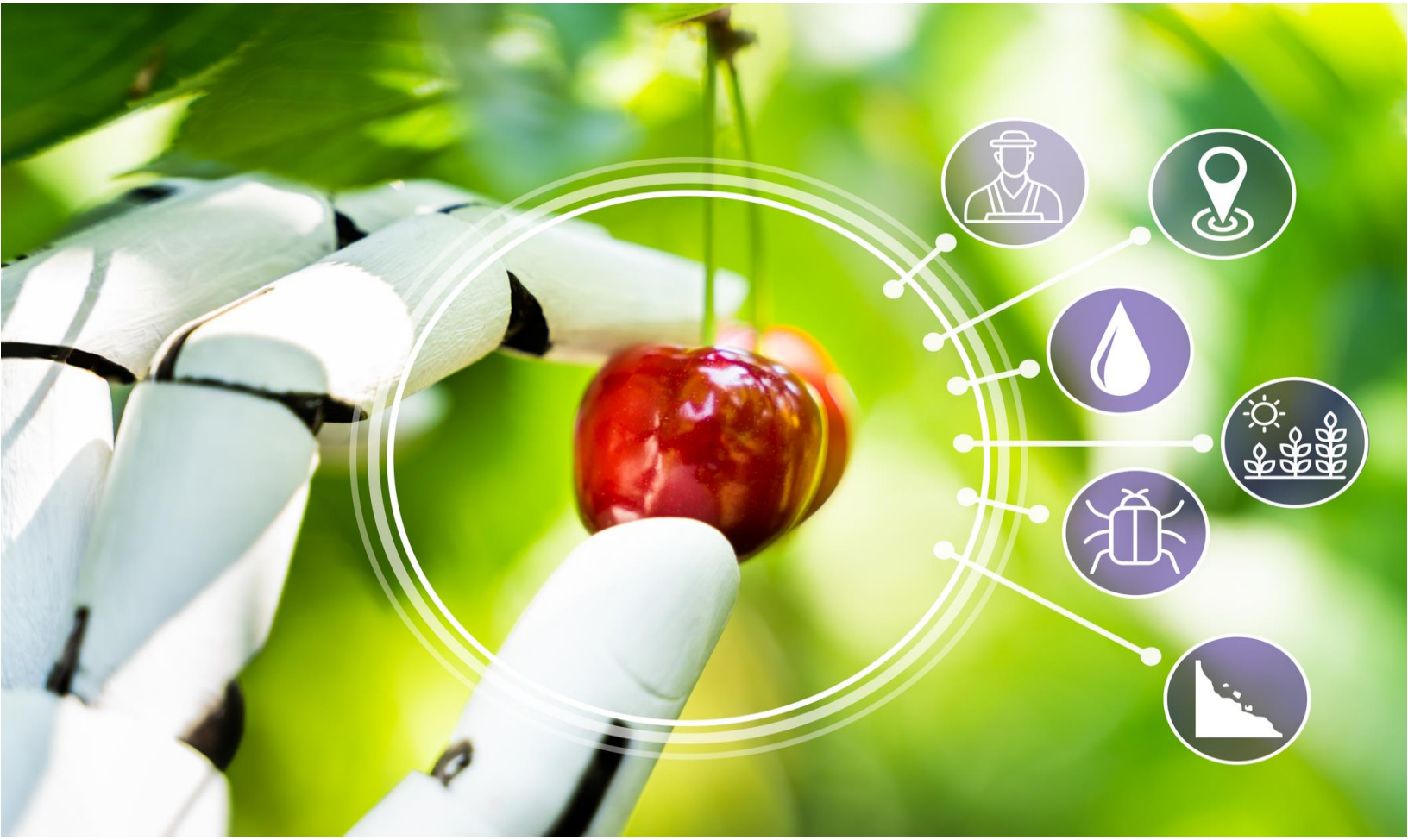

Picking cherries

Evidence on the effects of temporary and seasonal migrants on the New Zealand economy

NZIER report to the New Zealand Productivity Commission

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About this report

This report is one of a number of research inputs into the New Zealand Productivity Commission's inquiry into the economic contribution of New Zealand's frontier firms. For more information, see www.productivity.govt.nz/inquiries/frontier-firms/

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Key points

The literature holds few 'rules of thumb' when it comes to the impacts of immigration.

The best studies combine a rich understanding of the dynamics of labour markets with robust empirical analysis. Drawing general conclusions from specific studies is often inappropriate because local impacts depend on local circumstances.

Temporary and seasonal migrants can behave differently from permanent migrants. The horticulture sector is different from many other goods-producing industries. Combined, these differences caution against applying historical results from the overseas literature on permanent migration to temporary migration in the New Zealand horticulture sector today.

Substantial increases in temporary migration to New Zealand since 2003 have occurred with few economic studies of impacts on local workers, automation, or productivity, and limited economic analysis of what would have happened had this migration not taken place.

A recent econometric study suggests the overall impacts of temporary migration on local workers are modest and positive, with some larger positive and negative effects on various subgroups including young people, beneficiaries and migrant students. Technical challenges prevented this study separately identifying the impacts of working holidaymakers and workers entering through the Recognised Seasonal Employer (RSE) scheme.

Claims the RSE scheme constitutes an unquestioned 'triple win' for the workers, their employers and the New Zealand economy as a whole are hard to support based on the evidence collected to date.

The scheme clearly has some positive impacts on RSE workers, primarily because of limited opportunities for waged employment at home. Concerns about terms and conditions of employment, differences in market power, unequal access to the scheme and consequences for families and wider Pacific communities are growing, and will need to be addressed in ways that recognise the value participating in the scheme has for RSE workers and their communities.

Employers strongly support the scheme, but they may be the beneficiaries of visa conditions that make RSE workers more attractive at the expense of locals. While output in the sector has increased, we have little data to judge whether this is increasing overall productivity or is simply increasing scale.

Employers say the combination of RSE worker productivity and the certainty of having a reliable workforce on hand at critical points like harvest time is underpinning increased investment in plant and equipment, and creating opportunities for local workers. A firmer conclusion on the overall impact of the RSE scheme on local labour markets, automation and productivity will require empirical analysis using bespoke data.

The literature shows that provided policy is developed having regard to local conditions and kept under ongoing review, temporary immigration can provide net benefits to migrants and their host communities. Effective ongoing review and debate requires robust analysis based on up-to-date data. This should be a priority for government, employers, workers and the wider community.

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1 Introduction

The New Zealand Productivity Commission (the Productivity Commission) has engaged NZIER to expand on some of the analysis we undertook in our 2020 report on migration and frontier firms *Could Do Better*.[1]

In this new report, we outline the evidence from the economic literature on the impacts of seasonal, temporary migrant workers, and examine the short- and long-run impacts of low-cost/low-skill temporary migrant labour on the:

- wages and employment of the local labour force
- incentives on firms to invest in capital (particularly labour-saving technologies/automation) and
- productivity of domestic firms.

We have reviewed literature from New Zealand and other developed countries, with a particular focus on the horticulture sector.

2 Navigating the literature on the economics of migration

2.1 What the literature studies

The economic literature on migration is large and growing, but above all very broad.[2] This report examines some of the major contributions that are relevant to the Productivity Commission's current Frontier Firms inquiry.[3]

Major issues remain open to debate. As Francesco Fasani and his colleagues comment, "The literature on the economics of migration is rich and booming, but it is not settled yet".[4] In part this is because, as Timothy Hatton has observed, "A large empirical edifice has been constructed on a relatively slender theoretical base".[5]

Many studies are quite specific. Impacts can vary by time period, migration type and duration, the characteristics and motivations of migrants, and institutional arrangements in the host country.

1 Fry and Wilson (2020).

2 Searching for 'migration or immigration or emigration or refugee' in the subject field of the electronic database Econlit yields 100,410 hits, dating from 1889 to the present. Over 22,000 of those items were published after January 2016.

3 Reviews that we have found useful are Hanson (2008); Kerr and Kerr (2011); Fry (2014); Borjas (2015b); Dustmann and Görlach (2016a); Blau and Mackie (2017); Quak (2019); Dowlah (2020); Fasani et al. (2020) and Walerych (2020), together with several meta-studies by Longhi et al. ((2005), (2008a), (2008b) and (2010)).

4 Fasani et al. (2020).

5 Hatton (2014, p. 43). The literature we are reviewing is focused on the effects of migration on host communities and workers. It largely takes the causes of migration itself as given. To the extent that studies have a theoretical base, it is usually some variant of the so-called Borjas model, developed by George Borjas in the 1980s and 1990s. In this model, migration is motivated by differences in the average returns to labour and human capital in both the destination and source country. Essentially, migrants will choose their destination based on how they perceive that they will fit in to a new country (Dowlah (2020, p. 285)). The Borjas model builds on earlier pioneering work by A.D. Roy on occupational selection (Roy (1951)). That migrant location is self-selected has important implications for empirical work: migration cannot often be safely assumed to be a random result and doing so, without appropriate correction, leads to biased results.

As Liesbet Okkerse warns, "It is hard not to get lost in the multiplicity of empirical research results produced until now".[6] She also notes that it is necessary to understand the motivations of researchers and the context within which they are working. These motivations can have an impact on both the data selected and the methods employed.[7]

There is a range of plausible techniques, data, and assumptions that can be used to study the impacts of migration. Researchers can – either intentionally or unintentionally – seek combinations of these elements that reinforce their pre-conceptions, and publication bias means that studies that produce interesting results are more likely to see the light.[8] Provided that there are sufficient comparable studies, meta-regression analysis can overcome these concerns.[9] But because of all of these factors, individual results may well not be transferrable from one situation to another: it is necessary to know the context of any research and how its conclusions were reached to determine its wider applicability.

All this means that it can be unwise to rely too heavily on any one paper or model type when making policy recommendations.[10] Even widely cited studies may best be regarded as inputs which can help to form a view, rather than being definitive. Studies using novel data or techniques – particularly those that produce very different results from earlier studies – warrant particular caution.[11]

2.2 How are effects identified?

For empirical studies, the methodology used can also influence the results and whether they are relevant to other countries or events.[12]

There are three broad types of studies. The first specify a model and use parameters derived from theory and the literature to identify the effects of migration on various groups using data from actual events.[13] The second use data to estimate the parameters of a

6 Okkerse (2008, p. 2).

7 For example, there is a sizeable literature on the economic effects of migration in the United States in the 1980s that was searching for a plausible explanation for an observed increase in income inequality (Ibid, p. 2).

8 Publication bias occurs because "Journal editors and referees may be more likely to publish results that are statistically significant, that confirm some prior belief or, conversely, that are surprising" (Andrews and Kasy (2019)). Deirdre McClosky and Stephen Ziliak have long been concerned with the tendency of economists to favour statistical significance over economic significance (McClosky and Ziliak (2009)). A related issue is 'the file drawer problem', where authors will only submit for publication studies with strong statistical results. There is evidence of such bias in the economic literature (Christensen and Miguel (2018)).

9 Doucouliagos (2016).

10 Large as the economic literature is, economics is not the only discipline that studies migration. The focus of economic studies is on the causes and consequences of voluntary movement across borders. Common causative factors studied are wage differentials, quality and quantity of human capital, and proportions of factors of production. Effects are migrant behaviour and its economic impact. Other disciplines have different views on how to think about migration, which may lead them to draw very different conclusions from the same data. See Dowlah (2020), especially Table 11.1 on page 292. Policy therefore needs to reconcile sometimes competing views on how the world works.

11 Michael Clemens gives the example of a 2017 paper by George Borjas which, unlike most research on the 'Mariel Boatlift' (a mass exodus of largely unskilled workers from Cuba to Miami between April and October 1980 that brought 125,000 Cubans to Miami, adding about 7 per cent to its labour force) found large negative impacts on the wages of a particular subset of local workers (Borjas (2017)). This paper, which the Trump White House cited to justify its proposal to halve legal immigration (Sanders and Miller (2017)), was subsequently challenged on both empirical and theoretical grounds: see Peri and Yasenov (2018) and Clemens and Hunt (2019). Borjas has continued to defend his view (including in Anastasopoulos et al. (2019)), while Clemens described the original paper as "overturned" in a recent tweet thread (Clemens (2020)).

12 For an early discussion of the development of various techniques used in empirical studies in labour economics, see Hamermesh (2000).

13 Examples include Card (1990); Borjas (2003) and Peri and Yasenov (2018). See Table 1 in Dustman et al. (2016) for a more comprehensive list.

model and then deploy the model to predict the likely effects of various scenarios.[14] And finally, there are studies that use cross-country comparison of levels of migrants and macro-economic features of economies, like gross domestic product (GDP) per worker, to draw conclusions about the effects of migration.[15]

The first approach requires a counterfactual to be specified if causality is to be inferred: that is, what would have happened without the studied migration.[16] As Christian Dustmann and his co-authors point out, differences in how individual researchers go about constructing their counterfactuals and what they are seeking to explore can go a long way towards explaining what appear to be contradictory results in the literature.[17]

The second type of studies is often useful in assessing the effects of different policy options, since they allow for key factors that might affect outcomes to be isolated.

The third method places migration research within the domain of productivity studies and is useful when comparing migration with other potential drivers of productivity and economic performance.

2.2.1 Economists' thinking has developed

Understanding of the economic impacts of migration has developed over time, as new thinking, more sophisticated models, and better data have been brought to bear on the issue. Writing in 2016, Giovanni Peri described the evolution of thinking about the economic impacts of immigration in these terms:

> *[T]wenty years ago, economists typically framed their analysis of immigration as an increase in the supply of labor within a model of homogeneous workers and a downward-sloping labor demand, which was determined by the complementarity between labor and physical capital. This approach tended to focus the attention of the researcher on how immigrants competed with other homogeneous workers in the labor force while keeping everything else fixed, in a "partial" view of the labor market. More recent analyses offer greater flexibility. Researchers now distinguish different types of workers by their education and other important skill dimensions (such as ability in performing manual or analytical tasks). Moreover, immigration is now analyzed in a framework that looks at its total effects and accounts for many responses to immigrants: from native workers, in terms of possible complementarities and degrees of specialization; from firms, in terms of choices about capital and technology; and even from consumers, in terms of the mix of goods and services they choose to purchase. Unsurprisingly, this framework has*

[14] There are fewer of these sorts of studies in the literature. Examples are Manacorda et al. (2012) and Ottaviano and Peri (2012).

[15] Ortega and Peri (2014); Alesina et al. (2016) and Jaumotte et al. (2016).

[16] McKenzie and Yang (2010). There are two broad approaches in empirical economics that study policy. The structural approach estimates or calibrates primitives (parts of a model that are not defined by other concepts) to make predictions about welfare. The reduced-form approach (also known as the programme-evaluation or treatment-effect approach) estimates high-level behavioural elasticities thought to be qualitatively relevant for policy analysis, but does not provide quantitative welfare results (Chetty (2009)). Both types of approach are used in the literature we are reviewing (Brell and Dustmann (2019)). Indeed, David Card's 1990 study of the effect of Cuban migrants on employment conditions in Miami (Card 1990) is one of the pioneering applications of the reduced form approach (Borjas (2015a)). Examples of studies using a structural approach include Borjas et al. (1997), Manacorda et al. (2012) and Ottaviano and Peri (2012).

[17] They give the examples of work by prominent scholars David Card, George Borjas and Giovanni Peri (all with multiple co-authors) that have derived seemingly contradictory results when studying the effects of migration of wages on workers in the United States, sometimes while using similar data and studying the same event. Dustmann et al. suggest that these studies are actually studying different things, using different techniques and that their results are often, as a result, not comparable (Dustmann et al. (2016)).

produced a richer set of possible effects of immigrants on wages and employment of natives.[18]

2.3 Looking under lamp posts

Finding appropriate data is one of the great challenges of empirical economics. Understandably, some published work has used what data is available, even if it might not exactly be fit-for-purpose.[19] The literature calls this 'looking under lamp posts': when a researcher searches where the light is best (where there is more data), rather than where understanding might lie.[20]

Our reading of the literature is that there are few, if any, universal results that apply when it comes to **assessing the effects of migration in particular circumstances**. The drivers of impacts can pull in different directions, depending on the specific characteristics of the migrants concerned and the context. The answers to many questions regarding migration impacts are, essentially, empirical. To generalise the results of a range of studies requires the use of meta-regression.

To guide policy, it is important to look for the keys where they were lost – that is, to undertake detailed analysis using appropriate methodology and data.

2.4 Assessing immigration impacts

In this section, we survey a wide range of immigration studies and outline some of the core theoretical and methodological issues that commonly arise in the literature.

The issues we review are:

- Whose welfare counts, introducing the concept of 'immigration surplus'.
- The 'canonical model' of the impacts of a permanent migration shock on wages and capital.[21]
- More realistic model assumptions, such as differences in skills between migrants and locals, changes in technology and capital in response to those differences, and different host country characteristics.
- The impacts of migration on productivity.
- Local demand and fiscal effects.

[18] Peri (2016). Internal citations not included.

[19] As Daniel Hamermesh has commented, "We need to ask whether we have found the best available data for the purpose and, more important, whether those data offer any hope of representing the concept." (Hamermesh (2000, p. 364), emphasis in the original). He goes on the list a number of examples from the literature that have used available data in ways that have not withstood challenge.

[20] This is based on a very old joke that is much told by economists:

> *A drunk loses his keys and is looking for them under a lamp post. A policeman comes over and asks what he's doing. "I'm looking for my keys" he says. "Where did you lose them?" the policeman asks. "I lost them over there". The policeman looks puzzled. "Then why aren't you looking for them over here?" "Because the light is so much better here".*

This version is from Leaver (2014).

[21] We defer a discussion on the mechanisms by which temporary immigration affects local wages and employment to Section 4.2.4.

2.4.1 Whose welfare counts?

Many studies of immigration focus on the effects on **local workers in the host country**.[22] Their test of effects is whether wages or employment conditions or participation or unemployment are altered by the presence or absence of migrants.[23]

A further area of study is the total effect on the **whole local population**, or the 'immigration surplus', defined as the increase in output and income generated by immigration that accrues to pre-existing residents of the host county.[24]

Martin Ruhs goes further and suggests that the **distributional effects of migration**, especially on the lower ends of the income distribution, should be a specific aim of policy and thus research.[25] Ruhs notes that sending countries are also vitally interested in the **effects of emigration** on their populations.[26] In this context, New Zealand has one the largest rates of emigration, which has raised concerns about a possible 'brain drain'.[27]

Others take an even wider view, looking at the **potential world-wide gains** from removing, or at least reducing, restrictions on all types of migration. Michael Clemens says the economic impact of preventing large numbers of people in low-income countries from emigrating to richer countries amounts to leaving "trillion-dollar bills on the sidewalk" in terms of welfare losses.[28]

In our book *Better Lives*, we suggest that the goals of migration policy should extend beyond increasing income and output to encompass expanding the **wellbeing of both locals and migrants**, including potential migrants.[29]

In practice, some combination of the first three approaches is more likely to reflect political realities in recipient countries, particularly in relation to low-skilled seasonal and temporary migration.[30] As Timothy Hatton notes:

> *If workers outnumber the owners of capital at the ballot box then the median voter will oppose immigration, [even] though the total gain to capitalists exceeds the total loss to workers (there is a net immigration surplus).*[31]

22 Longhi et al. (2005), Longhi et al. (2008a) and Longhi et al. (2008b) are useful meta-studies.

23 Studies that examine impacts on migrants tend to find that they benefit from migration – see for example, the Australian Productivity Commission (2006). This makes intuitive sense: if migration were not beneficial, migrants either would not leave home or would seek to return home if the experience was disappointing. Joop Hartog and Rainer Winkelmann find evidence from Dutch migration to New Zealand to support this proposition (Hartog and Winkelmann (2003, p. 700)).

24 Brell and Dustmann (2019, p. 8). In some studies, pre-existing residents include groups of previous migrants.

25 Ruhs (2008, p. 405). In this context, Christian Dustmann and Ian Preston argue that while migration that is motivated by a desire on the part of migrants to receive higher returns on their skills will always lead to efficiency gains and higher output in host countries, those gains will be unequally distributed and some groups in the host country can be made worse off as a result (Dustmann and Preston (2019)).

26 Again, these interests depend on context and can run in different directions. For example, while low-income source countries might be concerned about the potential negative effects of emigration on the local economy, in particular, the loss of human capital, they can benefit from remittances sent back home. Returning short-term migrants can also bring with them skills acquired in the destination country that can be used at home. For an insight into the Polish reaction to the large outflow of workers following that country joining the European Union, see Walerych (2020).

27 Fry and Glass (2016, p. 3). Earlier work by Choy and Glass concludes that large flows of inward migration meant New Zealand experienced more of a 'same drain' with Australia and a 'brain exchange' with the rest of the world (Choy and Glass (2002)).

28 Clemens (2011, p. 84). This view dates back to at least the work of Hamilton and Whalley (1984).

29 Fry and Wilson (2018).

30 Brunow et al. (2015) provides a helpful overview of all the distributional effects for population groups in sending and receiving countries in Figure 19.2 and Table 19.3.

31 Hatton (2014, p. 51).

2.4.2 The 'canonical model' of wage and employment impacts

Early studies of migration impacts were based on what is often called the 'canonical model', in which all workers, whether they are locals or migrants, have the same characteristics.[32] The analysis is typically on a partial equilibrium or 'other things equal' basis, where the only external change to the economy is the number of immigrant workers.[33] Stephen Nickell set out the basic intuition of this type of model:

> *An influx of migrants lowers the capital-labour ratio, lowers the real wage, raises the return on capital and generates a net welfare gain for natives. The gains accruing to the owners of capital are greater than the losses faced by the suppliers of labour.*
>
> *In the long run, the higher return to capital stimulates investment and in the new equilibrium the capital-labour ratio, the real wage and the marginal product of capital will revert to their original levels under constant returns. The natives neither gain nor lose and the economy is simply that bit bigger.*[34]

In other words, while migration might have some initial effects on local workers, these effects are transitory and once capital adjusts, there is no effect on either local wages or employment. Gaetano Basso and Giovanni Peri describe this model as "a gross oversimplification", and say that when other crucial aspects are factored in, changes in the supply of immigrant workers can either increase or decrease the demand for local workers.[35]

2.4.3 Adding realism to the canonical model

Recognising its limitations, more recent studies have extended the canonical model.[36] Some extensions involve studying the effect of immigration within a general equilibrium setting, which allows a much wider range of relevant economic elements to vary.[37] As Def Dowlah comments:

> *From an economic standpoint, the movement of labor abroad changes the relative quantities of factors available in both source and destination economies and therefore it affects all factors of production—because immigrants are not only workers, they are also consumers, inventors, innovators, and so on.*[38]

The main drivers of migration impacts in these extended models are the skills of migrants compared to locals; how firms respond (including in relation to capital and technology); and the structure and characteristics of the host economy.

[32] Peri (2016, p. 11). Dustmann et al. (2016) and Brell and Dustmann (2019) provide detailed descriptions of the canonical model and discuss how it has developed through time.

[33] It is not always clear whether models in the literature are studying an open or closed economy. As Dustmann and Glitz point out, in an open economy there are fewer adjustment channels, since prices of tradeable goods are less influenced by local market conditions (Dustmann and Glitz (2015)).

[34] Nickell (2009, p. 57).

[35] Basso and Peri (2015, p. 1).

[36] Dustmann et al. (2016).

[37] McKenzie (1987). Computable General Equilibrium (CGE) models are mathematical models that, to varying degrees of abstraction, seek to analyse the effects of economic changes on the whole economy. Analysing an issue in a general equilibrium framework does not necessarily mean that the researcher has used a formal CGE model in any empirical analysis.

[38] Dowlah (2020, p. 300).

Differences between locals and migrants

The key issue here is whether migrants complement local labour or are substitutes.[39] Regarding skills and task allocation, more sophisticated models may assume some combination of the following features:

- **Immigrants and local workers have diverse skills** (including language abilities) and education levels.[40]
- **Immigrants and locals perform different tasks** in the host economy (for example, low-skilled immigrants may perform manual tasks and locals may take on roles requiring better communication skills).[41]
- **Local workers and firms can change what they do in response to immigration** – with local workers moving away from tasks and skills performed by migrants, and toward tasks and skills that complement migrants.[42]

Varying these assumptions has led studies of permanent migration to produce very different estimates, ranging from negative to positive impacts on aggregate local wages and employment.[43] Most studies find that the impacts of migration on the local labour market are modest, but a 2008 meta-analysis by Simonetta Longhi, Peter Nijkamp and Jacques Poot concluded that in order to guide policy "this broad conclusion needs to be supplemented with more refined statements that concern the outcomes in specific labour markets for specific workers at specific times."[44]

The meta-analysis identified two groups of people who might encounter larger negative impacts. Earlier migrants experience a statistically significant reduction in wages when new migrants arrive, and further analysis found the impact on their participation and employment might be even larger. Longhi and her colleagues also found greater impacts for locals who were unable to "'escape' a potentially harmful impact through other adjustments, such as outward internal migration, [or moving into jobs created as a result of] capital inflows or additional local demand."[45]

One issue that makes interpreting the results of migration studies difficult is that migration is not a random process. Migrants can select where they work and unsurprisingly, will

[39] Skills are complementary when the people with them can work together to produce something: a migrant doctor and a locally trained nurse complement each other in treating patients. Two doctors with the same skills, one local and one foreign trained, on the other hand, would be substitutes: you do not need both to treat a single patient.

[40] Some of these studies distinguish between college- and non-college educated workers (e.g. Card (2001); Card and Lemiex (2001); Ottaviano and Peri (2012)), while others distinguish those who have and have not finished high school (e.g. Borjas et al. (2008)). New Zealand research shows more skilled permanent migrants integrate into host economies more quickly than those who are less skilled. Steve Stillman and Dave Maré found that university-qualified migrants achieved wage and employment outcomes similar to those of locals faster than less skilled migrants did (Stillman and Maré (2009)).

[41] Peri (2016, p. 13).

[42] Ibid, p. 14.

[43] Dustmann et al. (2016) report different studies on the effect of immigration on wages have found divergent results, with some studies finding positive impacts (migration leads to locals' wages increasing) and others finding the opposite (more migrants lead to lower wages). As they explain, the studies are often looking at different effects on different groups. For example, Joan Llull found that increased migration had a negative effect on the wages of local men (Llull 2018)), while Mette Foged and Giovanni Peri found that migration had a positive effect on the wages of less educated locals, regardless of gender (Foged and Peri 2016)). These two results are not necessarily inconsistent.

[44] Longhi et al. (2008a, p. 185).

[45] Ibid, p. 186.

prefer countries where their skills are relatively scarce and where there are more opportunities to fill in gaps in the local labour market.[46]

In practice, migrant characteristics other than skills and education can also have important impacts on outcomes. These include motivations for migrating (such as ambition, work, family, or humanitarian reasons); prior experience (including familiarity with local 'ways of doing things' – which covers everything from social customs to using tools and machinery); reliability, enthusiasm and 'character'; and the alternatives migrants have to working in their new host country.[47]

Another important, but often overlooked difference between locals and migrants is intended length of stay. Christian Dustmann and Joseph-Simon Görlach observe that many studies of the effects of migrants on wages and other conditions do not adequately adjust for the fact that migrants have the choice to leave.[48] If sufficiently large numbers of migrants who experience low wages in their new county return home (or on-migrate to a third country), then including them in data sets may bias results.[49] Studies also often do not account for the fact that locals too have the choice of migrating, either internally or to another country, in response to the effects of migrants on their communities.[50]

Changes in capital use

As with local labour, migrant labour can either be used alongside, or instead of, existing local capital. In practice, there are likely to be varying degrees of substitutability or complementarity between different types of migrant labour and capital, again depending on specific characteristics and circumstances.

As Julie Fry and Hayden Glass explain:

> *As the economy adjusts [to increased immigration] it can require more and different capital and new ways of working. If capital adjusts in response to labour growth, productivity may improve, especially if the new capital is invested in updated technology.*
>
> *If capital growth does not keep up with the rising supply of labour, and the economy adjusts to immigration by adopting more labour-intensive modes of production, productivity may fall. This has occurred in New Zealand in the past.*[51]

Individual firms will choose technology and capital equipment based on the skill level of the available labour force.[52] Giovanni Peri notes that this can lead to more or less manual-intensive processes, depending on circumstances. If there is a greater supply of low-skilled labour, firms may choose more labour-intensive production techniques, and may reduce

46 Fasani et al. (2020, p. 4).

47 We discuss the effect of home country alternatives in relation to workers entering New Zealand under the Recognised Seasonal Employer scheme in Section 4.2.3 below.

48 Dustmann and Görlach (2016b). Foged and Peri (2016) make a similar point.

49 Dustmann and Görlach (2016b) note that in 2008, the OECD estimated that between 20 and 50 per cent of migrants to OECD countries leave their new country within five years of arrival.

50 Okkerse (2008, p. 9).

51 Fry and Glass (2016, p. 21).

52 See Acemoglu (2002, p. 798) for an early discussion of this point.

mechanisation of some processes.[53] Alternatively, firms may introduce technologies that could be used with unskilled workers.[54]

These results are all based on studies of permanent migration, and firm behaviour may well be different when migration is seasonal or temporary. We discuss the case of seasonal temporary migrants in the horticulture sector below.

Host economy characteristics

The models we have discussed so far mainly focus on the supply side of the labour market: the amount and type of labour that is brought into an economy via migration. However, the nature of the host economy can also influence the speed and extent of adjustment to migration.

Host economy characteristics that models may incorporate include:

- **The flexibility of labour markets**, which is determined in part by the type and strength of regulation (including worker protections and the level and reach of minimum wages), access to unemployment benefits, and labour mobility.[55] Flexible labour markets will see changes in factor returns move through the economy more quickly than highly-regulated economies.
- **The composition of the economy**, and in particular, how large, dynamic and productive the sectors employing migrants are compared to the rest of the economy.[56]
- **The degree of openness to trade** – which influences the degree to which prices can adjust (the more open the economy is to trade, the less responsive local prices are).[57]

2.4.4 Impacts of migration on productivity

The study of the impact of migration on productivity proceeds in the literature as a combination of work based on the canonical model and more traditional, broad cross-country, macroeconomic models.

In general, the literature finds two mechanisms by which migrants can affect the receiving country's long-term prosperity.

[53] Peri (2016, p. 15). See Lewis (2011, p. 1037) for further discussion. Brell and Dustmann note that in this strand of the literature, the adjustment to a labour shock occurs without any effect on local labour (Brell and Dustmann (2019)).

[54] See Peri (2016, p. 15).

[55] See Angrist and Kugler (2003) and D'Amuri and Peri (2014), which connect smaller adjustment of locals and larger displacement effects of immigrants in European markets to less flexible labour markets and higher hiring and firing costs. As Longhi et al. (2008b) note, "[T]he lower wage flexibility that characterises EU countries might reduce the wage impact of immigration, but consequently increase the effect on employment of natives. In addition,… adjustment effects such as natives' migration are likely to be stronger in countries with high rates of internal mobility. The relatively high labour mobility in the US may be responsible for the relatively smaller impact of immigration on labour markets." (p. 186). We note, however, that since this was written, rates of internal migration in the US have fallen considerably (see Short (2019)). This might imply that the wage-change dampening effect of internal migration in the US may now be weaker than in the past. We thank Jacques Poot for this observation. More recent work by Giovanni Peri notes that, "the effects of immigration on labor markets and on outcomes for native workers seem likely to interact with the flexibility and openness of labor market policies in a country, including rules about unionization and collective bargaining, protections for incumbent workers, and policies that seek to smooth labor market adjustment costs" (Peri (2016, p. 26)).

[56] For example, large, dynamic sectors employing highly skilled migrants can have substantial positive productivity impacts. See Saxenian et al. (2002); Saxenian (2007); and Saxenian and Sabel (2008) for their pioneering analyses of the operation of these effects in Silicon Valley. At a regional level, where horticulture is a significant part of the economy, migrant labour can have a disproportionate impact on the local economy (see Rutledge and Taylor (2019) for a discussion of this point in relation to parts of California).

[57] Dustmann et al. (2008).

Immigrants are more likely to be of working age than the local population. This means that provided they work (and do not displace locals), migrants can boost GDP per capita by increasing the share of the working aged population that is productively employed. The empirical evidence on this channel of influence is mixed, with some studies finding positive effects,[58] while others find the opposite.[59] The key empirical point is whether the proportionate increase in production is greater than the increase in the labour supply (since labour productivity is measured as output divided by labour input).

Immigrants also influence labour productivity directly. In the short term, immigration can reduce labour productivity, as the increased labour supply reduces the amount of capital available per worker. The long-run effects of migration shocks will depend on what adjustment path the economy takes.

Florence Jaumotte, Ksenia Koloskova, and Sweta Saxena examine whether permanent immigration can increase labour productivity by "increasing the diversity of skills and ideas, fostering skill complementarity and specialisation, and encouraging the upgrading of natives' skills".[60] They also point out that, conversely, "a large entry of low-skilled immigrants could change the sectoral specialisation of the economy, for instance toward lower-productivity sectors such as construction, lowering [Total Factor Productivity]."[61]

Building on earlier cross-country studies,[62] Jaumotte and her colleagues find that migrants help increase per capita income levels in host advanced economies, primarily through an increase in labour productivity.[63] While they find a positive correlation between the share of migrants in the population and GDP per capita, they caution that the observed levels of increase in migrant share were small.[64] The authors also warn that by focusing on economy-wide averages, their model is unlikely to be sensitive to issues like the type of migration (refugees versus economic migrants), labour market structure, and the extent of complementarities between migrants and natives. Lack of complementarity between migrants and the rest of the labour force, as we noted above, can significantly reduce the positive effects of migration.

A separate line of inquiry in the literature looks at the effect of 'spillovers', or externalities, from migration, using an 'endogenous growth' framework.[65] These externalities can occur through agglomeration effects, diversity effects, reducing the cost of local services, and generating negative effects on fixed local factors such as land or housing.[66] Theoretically,

58 Card (1990); Peri and Sparber (2009); Ottaviano and Peri (2012); Peri et al. (2015).

59 Jean and Jimenez (2007); Ho and Shirono (2015).

60 Jaumotte et al. (2017). While the authors do not make this explicit, Figure 2 on page 4, which presents numbers of migrants as a percentage of the total population, implies that the study examines permanent migration.

61 Jaumotte et al. (2016, p. 3).

62 Ortega and Peri (2014); Alesina et al. (2016).

63 Jaumotte et al. (2016). New Zealand is included in their dataset.

64 This is another example of the concern of Deirdre McClosky and Stephen Ziliak mentioned in footnote 8 above, about the difference between economic and statistical significance.

65 The term 'endogenous growth' refers to a diverse body of economic analysis that emerged in the 1980s looking at the private and public choices that lead to observed rates of national economic growth and differences in growth between countries (Romer (1994)).

66 Peri (2016, pp. 15-16). Whether the effects that migrants have are externalities that reduce efficiency or are a normal working of markets needs to be examined carefully. There was an intensive debate from the 1930s to the 1950s on the issue of whether all behaviours that have economic consequences for other actors should be classed as 'externalities'. The debate was finally resolved by Jacob Viner in 1931 (Viner 1931) and Tibor Scitovsky in 1954 (Scitovsky 1954) identifying two separate concepts of externalities. 'Pecuniary externalities' are now regarded as not constituting a market failure, while 'technological externalities' do. Technological externalities are those that directly impact on the welfare of another party, while pecuniary externalities indirectly affect others by way of changes in relative prices. Buchanan and Stubblebine refer to a similar concept of 'Pareto-relevant' externalities, being those

spillovers can be positive or negative and thus again the effect of migration of locals and the wider economy becomes an empirical question.

Agglomeration effects may result from the reduced transport costs, increased local learning, and larger, more efficient labour markets that can occur if immigrants concentrate in densely populated urban areas.[67] Immigrants from different birthplaces may produce a wider range of ideas and increase the diversity of local goods and services.[68] Very highly skilled migrants can boost innovation.[69] Immigrants can also reduce the costs of local services such as housekeeping, gardening, and child care, thereby enabling locals who use those services to be more productive.[70]

A further stream of papers looks at the reaction of local workers to the arrival of migrants with competing skills. Giovanni Peri and Chad Sparber describe a dynamic where in response to competition, less-educated locals move from physically demanding jobs to more language-intensive roles which earn higher returns.[71] This can result in higher productivity.

2.4.5 Demand and fiscal impacts

As well as increasing the supply of labour, immigrants increase the demand for goods and services in the host economy. Migrants need somewhere to live, food to eat, access to transport and healthcare, and so on.

Some international evidence suggests that temporary migrants boost demand in the host economy less than permanent migrants.[72] In examining the impacts of increased temporary migration to the United Kingdom following the 2004 accession of the 'A8' countries to the European Union, the Bank of England noted several possible reasons for this, including temporary migrants saving more so they could send remittances home, spending less on durable goods because they weren't staying permanently, and being more likely to live in communal housing.[73]

Migrants also pay taxes and may consume public services. Many studies in the literature examine whether migrants are net contributors or recipients of government provided services and taxes. Studies of permanent migrants typically find positive fiscal impacts at a point in time, because screening ensures migrants are more likely to be healthy and

that prevent an economy from reaching a Pareto-efficient outcome (Buchanan and Stubblebine 1962). Pecuniary externalities can have equity or distributional effects, but do not reduce efficiency.

67 Ellison et al. (2010); Greenstone et al. (2010); Chassambouli et al. (2015).

68 Ozgen et al. (2014); Giovanni et al. (2015).

69 There are many examples, especially in the United States, of highly-skilled migrants making significant contributions to scientific research and development and innovation. See Lundborg and Segerstrom (2000); Kerr and Lincoln (2010); Hunt and Gauthier-Loiselle (2010).

70 Cortes (2008); Cortes and Tessada (2011).

71 Peri and Sparber (2009).

72 This is not to suggest that seasonal migrants do not have local demand impacts, just that these impacts are likely to be smaller than those generated by permanent migrants. Where, as is the case with seasonal horticultural workers, seasonal migrants are living in a concentrated area, their annual arrival can have an equally concentrated impact on the micro-economy in which they are residing.

73 Blanchflower et al. (2007, pp. 24; 53). The 'A8' accession countries are the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia. A separate paper by William Olney, which does not distinguish between permanent and temporary migrants, finds that a one per cent increase in remittances reduces wages of local workers by 0.06 per cent, due to the reduced boost to host-country demand (Olney (2015)).

working than the rest of the population.[74] We are not aware of any research on the fiscal impacts of temporary and seasonal migrants in New Zealand.

2.5 What does this mean for New Zealand?

While large and broad, the international literature on the effects of migration provides little guidance as to what those effects might be. As the Bank of England commented after examining large increases in **temporary** migrants in the United Kingdom, "The overall impact of immigration… is on its own not clear-cut – there is no automatic rule-of-thumb that we can look to in order to determine the impact on the economy."[75]

Synthesising the key findings of 20 New Zealand research projects on the economic impacts of **permanent** immigration conducted from 2005 to 2010, Rob Hodgson and Jacques Poot concluded:

> *…immigration has made a positive contribution to economic outcomes in New Zealand… fears for negative economic impacts such as net fiscal costs, lower wages, and increasing unemployment find very little support in the available empirical evidence. Moreover, the economic integration of immigrants is broadly successful. Once migrants are in New Zealand for more than 10–15 years, their labour market outcomes are predominantly determined by the same success factors as those for the New Zealand born…*[76]

These results are consistent with those from the international literature on permanent migration.[77] However, Hodgson and Poot also note that most of the data used in the studies did not differentiate between permanent and temporary migration, identifying such differences as "a major topic for future research".[78]

3 Low-cost, low-skilled seasonal and temporary migrants

Before turning to the New Zealand-specific literature, we provide some brief local context, discuss some key differences between temporary and permanent migrants, and examine some distinctive features of the horticulture industry.

3.1 Temporary migration is significant and increasing in New Zealand

Temporary migrant workers are a significant part of the workforce in many OECD countries. Figure 1 shows the number of permits issued by selected OECD countries to temporary migrants who have access to the host country labour market.[79] New Zealand has by far the highest number of temporary work permits issued on a per capita basis.[80]

74 This was the case in New Zealand – see Nana et al. (2003).

75 Blanchflower et al. (2007, p. 23).

76 Hodgson and Poot (2011, p. 1).

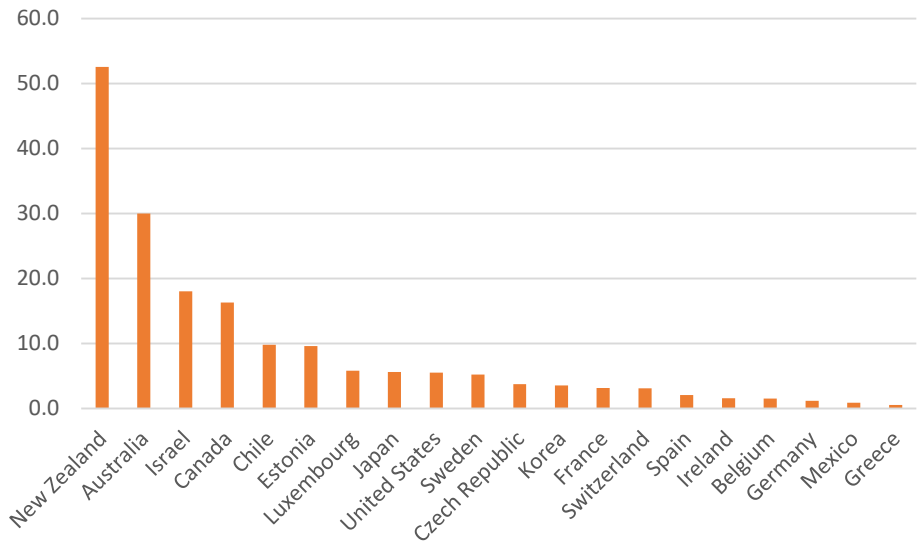
77 Fry and Glass (2016).

78 Hodgson and Poot (2011, p. 45).

79 The OECD uses the word 'permit' to cover all authorisations to entry a country. In New Zealand, these authorisations are called 'visas'. A permanent migrant is someone who has the right to reside in the country in question indefinitely. A temporary migrant is any person whose status does not enable them to remain in the host country without a status change subject to additional

Figure 1 Temporary permits with work rights issued

Per thousand of population

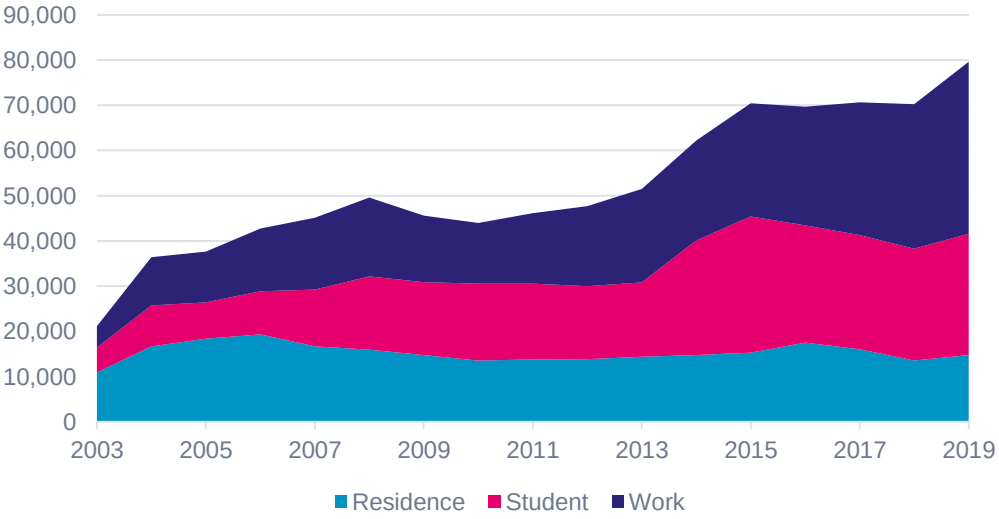


Source: OECD (2019)

Inflows of temporary migration into New Zealand have increased substantially since 2003.

Figure 2 An increasing proportion of visas are temporary

Estimated gross migrant arrivals, 12/16 rule[81]



Source: Statistics New Zealand

conditions. Residents of countries that have free-travel arrangements (like Australia, New Zealand and the EU) are not included under these definitions.

80 OECD (2019).

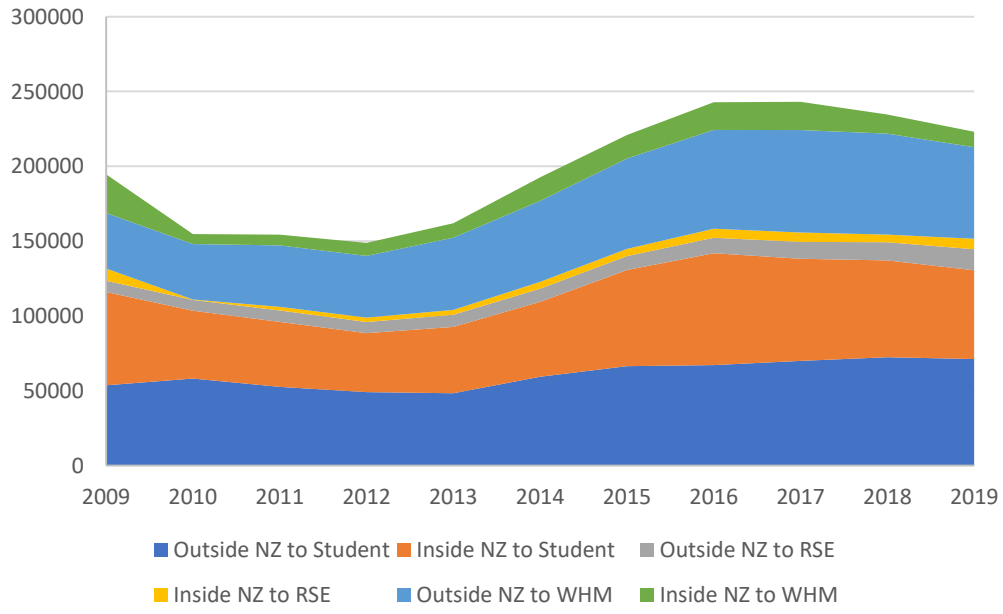
81 Note that Statistics New Zealand classifies someone as a 'permanent and long-term migrant' if they stay in New Zealand for over twelve months in the sixteen months after arrival, regardless of their visa status. This is known as the 12/16 rule. The figure breaks down the gross number of arrivals into three classes of visa type: permanent resident (where there is no time limit), and two types of time-limited visas: students and work. Because it is visa-based, it excludes returning New Zealanders.

As Figure 3 shows, the number of residence class visas granted has remained reasonably stable, while temporary worker and student numbers have risen significantly.[82] Note that the effect of migrants on the local economy is determined more by their actual presence and behaviour than on the legal status on which they are here.[83]

Looking at a more granular level, there were significant increases in the numbers of visas granted to fee-paying students, working holidaymakers and short-term workers in the horticulture and viticulture sectors over that period. All three of these types of visa-holders currently have some rights to work in New Zealand.

Figure 3 shows that in the peak year, 2017, there were almost a quarter of a million people in New Zealand on one of these three visas.[84]

Figure 3 There have been large increases in temporary migrants with work rights



Note: RSE means Recognised Seasonal Employer and WHM means working holidaymaker.

Source: Ministry of Business, Innovation and Employment

The absolute number of students with work rights and working holidaymakers is far greater than temporary migrants entering New Zealand under the Recognised Seasonal Employer scheme. Before COVID-19, the RSE scheme supplied about 16 per cent of horticultural

82 This is the result of policy design. The number of residence-class visas has been tightly regulated since 2003, while most temporary migration is uncapped.

83 We thank Jacques Poot for this insight.

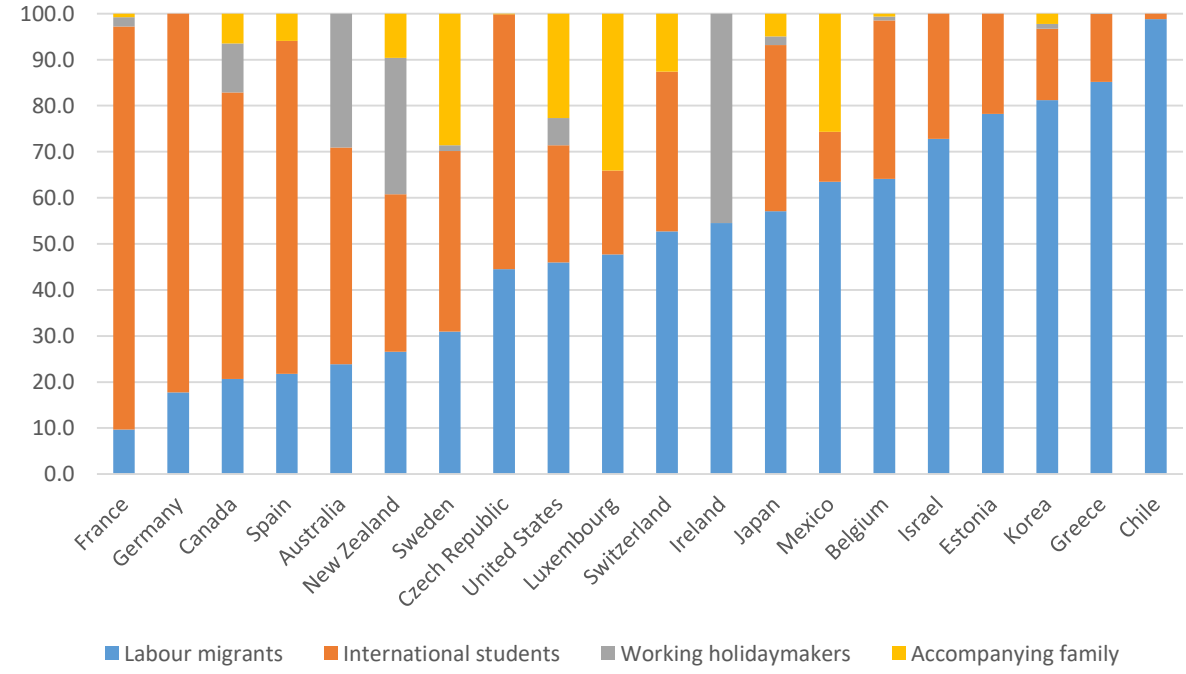
84 Relative to local workers, each of these classes of temporary workers faces additional employment restrictions (Fry and Wilson (2020, p. 13). Working holidaymakers can generally work unlimited hours but cannot undertake permanent employment. Most fee-paying international students face limits on working hours: they are only allowed to work up to 20 hours per week while studying but can work full-time during holidays. RSE workers must be employed by a Recognised Employer and can only work for a limited period each year.

workers, while backpackers and migrant workers supplied 29 per cent, leaving 55 per cent of the workforce as locals.[85]

As Figure 4 shows, New Zealand, Australia and Ireland are outliers when it comes to the proportion of temporary workers who are students and working holidaymakers.[86] The OECD estimated in 2017 that working holidaymakers comprised almost one per cent of New Zealand's employed population. Students added between 0.4 and 1.1 per cent.[87]

Figure 4 Share of permits issued to categories of temporary migrants

2017



Source: OECD (2019)

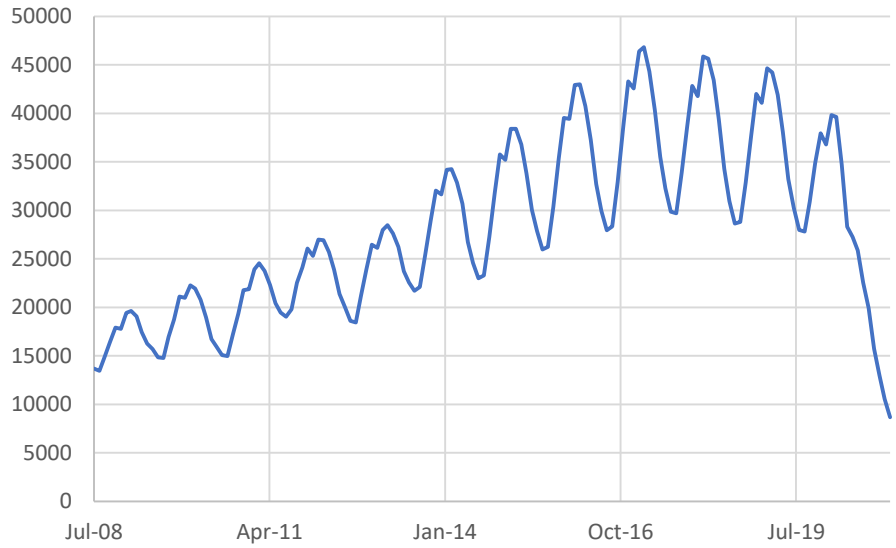
Visa data from the Ministry of Business, Innovation and Employment (MBIE) presented in Figure 5 shows that the population of working holiday makers in the country at any one time is highly seasonal. This suggests that the potential supply of visa-holders available for work is also seasonal. Full-time students also have a seasonal component to their potential labour supply, as they are able to work twice the number of hours during holidays.

85 Curtain et al. (2018).

86 Again, note that people in a country under a free travel arrangement are not included. Illegal immigrants are also excluded.

87 All OECD figures are on a full-time equivalent basis (OECD (2019)).

Figure 5 The supply of working holidaymakers is seasonal



Source: Ministry of Business, Innovation and Employment

3.2 Temporary and permanent migrants are often different

Most of the evidence from the economic literature on the impacts of immigration relates to permanent migrants – that is, people who have moved from one country to another, and can remain there indefinitely.

Although a significant proportion of New Zealand's permanent migrants first entered the country as temporary workers, it is typically not appropriate to regard temporary workers as future permanent workers who have simply spent less time in their new host country.[88] Temporary seasonal migrants may have different characteristics and motivations, access different opportunities, and face additional restrictions, all of which can lead them to behave differently from permanent migrants.

When assessing both short- and long-term impacts of temporary migration, it is important to study the impacts specific people might have in particular contexts, rather than making inferences based on initial impacts of permanent migration.[89]

3.2.1 Working holidaymakers and students with work rights

One important difference between temporary migrant workers and other migrants is their motivations for relocating. While being employed is often a planned part of the move for working holidaymakers and international students, their visas require that their principal motivation is either a holiday or study. This can lead to the phenomenon of 'downgrading', where migrants receive lower wages and conditions than locals with similar educational qualification and experience.[90] In some cases part of this may be due to unobserved skill shortages (for example, foreign-trained professionals with significant work experience may have low language skills that impact on their earnings ability).

[88] Dustmann and Görlach (2016a).

[89] Blanchflower et al. (2007) and Dustmann and Görlach (2016a).

[90] Dustmann et al. (2016). Poot and Stillman (2016) report New Zealand evidence on downgrading.

More generally, short term migrants like students and working holidaymakers may be prepared to take positions for which they are overqualified because their motivation is either to quickly find a job that provides an adequate wage that does not interfere with their studies (working at a convenience store near campus) or because they are seeking new experiences, not a career (waiting tables under 'gig economy' conditions in Queenstown).

Glenys Harding and Elizabeth Webster observe in relation to Australia that the level of post school qualifications held by working holidaymakers compared very favourably with the educational profile of Australian residents working in typical low-skill casual jobs.[91] They found working holidaymakers could gain employment where unemployed locals in the same area could not:

> *Our surveys found that employers generally hire [working holidaymakers] because they make themselves available. Local unemployed youth do not hold a strong interest in these jobs and are not as prepared to relocate for employment.*[92]

In contrast, a recent New Zealand study conducted for MBIE by Keith McLeod and Dave Maré using Statistics New Zealand's Integrated Data Infrastructure (IDI) database found that the presence of international students led to more local young people and beneficiaries being hired. They suggested the impacts on youth hires "could be related to an increase in student migrants… who are likely to have consumed services in industries where young people tend to work".[93] However, the same study also found the Study to Work visa category negatively impacted youth hires, leading the authors to suggest that migrants on this visa and local young people "may be competing for the same jobs".[94] The authors were unable to identify empirical impacts for working holidaymakers, possibly because "the very nature of being on holiday may lead to behaviour that is unpredictable".[95]

3.3 What is special about horticulture?

Growing food is different from producing many other products.[96] The production process is biological and involves combining the usual economic inputs of labour and capital with resources from nature (land and weather) with time. This generates a higher degree of production risk than occurs in other sectors: harvests are inherently variable due to natural conditions such as weather and pests.[97] Decisions about what and how much to plant must also be taken in the absence of complete information about market conditions at the time of harvest, which may be months or years ahead.[98] Labour requirements are seasonal[99] and

91 Harding and Webster (2002, p. 6).

92 Ibid, p. 7.

93 McLeod and Maré (2018, p. 33).

94 Ibid.

95 Ibid, p. 14.

96 Our terms of reference point us to discussing the effects of low-skilled seasonal, temporary labour. In New Zealand, the current seasonal migrant schemes only apply to the horticultural (plant-growing) and viticulture sectors, mainly fruit, vegetables, and wine. There is extensive discussion in some of the literature, especially from the United States, about whether livestock farming should be included in seasonal worker schemes. The theoretical justification for exclusion is that such farming is year-round. We acknowledge that at least in New Zealand, there is a considerable seasonal element in such farming (lambing and calving, shearing, milking), a point also made by Tipples and Rawlinson (2014). However, whether livestock farmers should have access to RSE workers is outside our scope.

97 Taylor (2010, p. 371).

98 Developments like the futures market have allowed this risk to be shared somewhat. See Pennings and Meulenberg (1997).

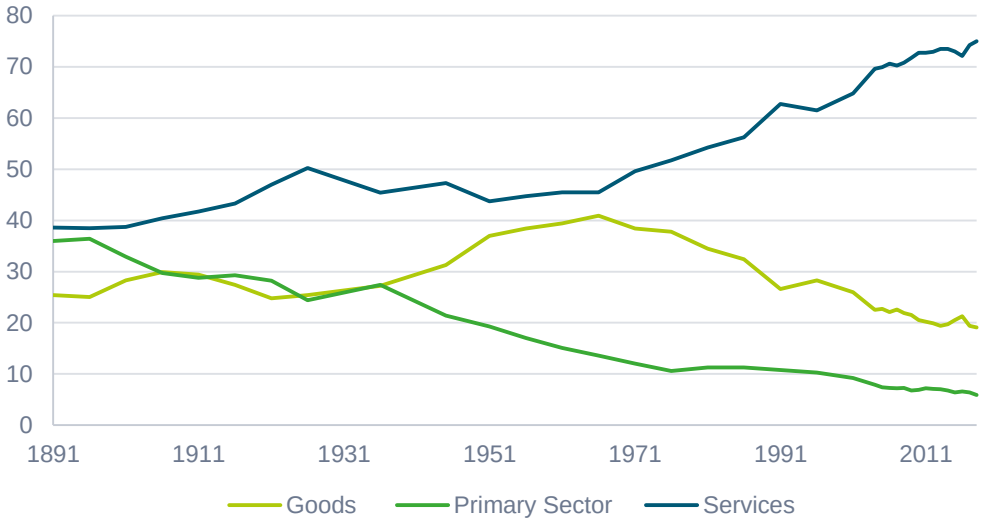
depend on natural processes, both throughout the growing season and at harvest time.[100] The biological nature of production also has implications for automation. For example, it may be necessary to use different types of trees planted in different configurations in order to enable automated harvesting.[101]

3.3.1 The farm labour problem

In high-income countries, food production often relies heavily on low-cost imported labour.[102] J. Edward Taylor explains that this "farm labour problem" is the result of a long process of industrial development, which has seen the share of food production in the Gross Domestic Product of advanced countries fall progressively and employment options for former farm workers expand dramatically. [103] New Zealand is no exception.

Figure 6 The New Zealand primary sector workforce is falling

Proportion of the work force by broad category



Source: www.data1850.nz

It is increasingly likely that someone with the physical capacity and skills to undertake farm work may have opportunities to gain employment in other industries that pay more and offer better working conditions.

99 Highly seasonal labour requirements are not unique to the agricultural and horticultural sector. For example, in New Zealand, the labour needs of the tourism sector are also highly seasonal.

100 This can result in both positive and negative outcomes. Bumper crops require more harvesting staff. In contrast, the severe hailstorm that struck the Nelson region in December 2020 and destroyed the entire crops of some Motueka fruit growers (Bell (2020)) and a subsequent heavy rainstorm in Central Otago that rendered between 40 and 60 per cent of the cherry crop unsaleable (Jamieson (2021)) both reduced the demand for seasonal workers.

101 He and Baugher (2018).

102 Food production is not, however the only industry that uses low-cost migrant labour. Iain Campbell cites Australian research showing that many service industries, including tourism, are even more labour-intensive (Campbell (2019, p. 48)).

103 Martin and Taylor (2003); Taylor (2010); Charlton (2019).

3.3.2 Scarcity and reservation wages

This brings us to the issue of what labour economists call the 'reservation wage': the lowest wage rate at which a worker would be willing to accept a particular type of job.[104] While termed a 'wage', the concept of the reservation wage also applies to non-wage elements of employment, like location, hours of work and the physical demands of the job. The core idea is that the amount that an employer needs to offer a potential employee will be influenced by what they could earn elsewhere. A person with the option to work short hours, close to home, in a pleasant work environment, doing interesting work will have a high reservation wage when offered dirty, back-breaking, monotonous work in a field far from where they live.

This explains why the available local supply of potential farm workers has fallen throughout much of human history, and continues to fall today.

If the reservation wages of local potential farm labourers are increasing, farmers have a problem: how to retain profitability in the face of an externally generated increase in the cost of a key input?[105] Taylor suggests that like all producers faced with this problem, farmers have several choices:

> *In the short run, they can hire more workers, provided that these workers are available, or, if wages are too high, leave produce unpicked. In the longer run, they can seek technological or cropping solutions that reduce labor use on the farm. Alternatively, instead of investing in labor conservation, farmers may choose to invest in the political process as a means to secure access to new labor supplies abroad.*[106]

Christoph Albert suggests that locals and migrants can have different reservation wages, even if they have exactly the same characteristics and are equally productive (that is, are substitutes). This is because differences in alternative employment choices, access to unemployment benefits and other social assistance, and risk of deportation or not being hired in future, may change the relative level of bargaining power workers have.[107] Since the prices that employers can earn for their products is, under competitive market conditions, fixed, employing the workers with the lowest reservation wage will lead to higher returns for the employer.

This is why low-cost imported labour is a near-universal feature of agricultural production in high-income countries: farmers (often through directly or indirectly influencing immigration policy) have solved the farm labour problem by seeking to employ people with low reservation wages. The reservation wages of migrants will be heavily influenced by the

[104] The idea of reservation wages comes from standard models of job search, independently pioneered by John McCall and Dale Mortensen in the 1970s: McCall (1970) and Mortensen (1970). For an early application to migration, see McCall and McCall (1987). The idea is that people looking for jobs (whether they are already employed or are unemployed) will not accept the first job they find for which they might be qualified, but rather will keep searching until they find a job that they prefer, subject to the costs of searching (which can include the cost of being unemployed). In doing this, workers develop a mental idea of the minimum terms of employment (including wages, location, hours, etc.) that they will accept. This bundle of features is called a 'reservation wage' (Constant et al. (2017)).

[105] Reservation wages apply on the supply side of the labour market. On the demand side, it is a general finding of labour economics that employers' willingness-to-pay depends on labour productivity, and thus more productive workers should be able to command higher wages. See van Biesebroeck (2015).

[106] Taylor (2010, p. 370).

[107] Albert (2021, p. 36). While many of these factors, like access to social programmes, are objective, the perception of risk of deportation or not being rehired will be subjective on the part of the worker. What matters for their behaviour is what they think the risk is, which may be different from the actual chances.

employment conditions in their home country, and migrant workers from low-income countries will naturally tend to have low reservation wages. This goes a long way to explaining why they will be prepared to work under conditions that locals are not. We return below to what effect this might have on the New Zealand labour market.

In the United States in particular, using illegal labour is one way of keeping agricultural reservation wages low.[108] If workers face a credible threat of deportation if they complain about their employment conditions, then they are likely to accept a lower wage than someone with wider and more enforceable work rights. Employers are likely to understand these differences and thus, within the regulations of the labour market, offer temporary migrants different working conditions from those they might offer locals and permanent migrants.[109]

3.3.3 Capital and automation

Investing in capital is generally riskier than investing in migrant labour. Up-front costs can be high, and especially when specialist equipment is involved, decisions are less easily reversed.[110] The horticulture sector's characteristic seasonal production and volatile output and prices all generate additional barriers when considering investment in capital and automation.

When expensive equipment is in use for only a few weeks or months each year, it can be more difficult to obtain an adequate return on that investment. When all growers need to plant, prune, harvest or pack at around the same time, the ability to share expensive capital equipment locally is limited. Sometimes, international circulation of expensive machinery is possible.[111] The duration of equipment use can also be prolonged to some degree by spacing out the timing of planting annual crops, and planting different varieties of perennial crops with different maturity times, although weather and climate patterns impose limits. However, despite these challenges, automation is a longstanding feature of the local horticulture industry.[112]

As with any prospective capital investment, the availability of alternatives plays an important part. We have written elsewhere about how different degrees of capital intensity in the Californian and Australian wine industries have resulted from differences in the availability of low-skilled labour.[113] As discussed in Section 4.3 below, evidence from California, where short-term migrant labour is a much-studied part of the local horticulture

[108] See Taylor (2010) for the United States. Tipples (2017, p. 12) notes that the use of illegal migrant labour was relatively widespread in New Zealand prior to the introduction of the RSE scheme.

[109] For example, in the early days of the RSE scheme, the Council of Trade Unions strongly expressed concerns around RSE workers not being paid the minimum wage (Franks (2009)).

[110] Charlton et al. (2019) point out that while an employer can usually hire and fire migrant workers relatively readily, capital is a fixed charge. If a squeeze on profits emerges, the capital-intensive route ends up being much riskier.

[111] Richard Bedford gives the example of picking machines being hired for long enough to meet local seasonal needs and then shipped on to a country with different growing seasons (Fry and Wilson (2020, p. 27)). However, we note that this is less likely to occur for crops such as kiwifruit, where New Zealand is a dominant global supplier and growers have adapted and developed bespoke technology.

[112] As just one example, Patricia O'Shea reports that the first tobacco planting machines had arrived in New Zealand from Canada by 1912 (O'Shea (1997, p. 14)).

[113] Fry (2014, p. 11); Fry and Wilson (2020, p. 20).

industry, indicates that a steady reduction in legally available labour induces at least some growers to look to automate.[114]

4 The Recognised Seasonal Employer scheme

We now review the literature on the New Zealand Recognised Seasonal Employer scheme.

Much of the analysis of the RSE scheme has been qualitative and descriptive in nature.[115] It has been undertaken by a range of scholars across a range of disciplines (economics, geography, anthropology, sociology) using analytical frameworks that are well suited to those branches of scholarship.[116]

We are not aware of any detailed econometric analysis of the RSE scheme of the sort conducted overseas that we discussed in Section 2.2 (that is, using structural models to assess impacts or simulation studies to predict possible outcomes).[117] However, we can see in the available literature examples of the sorts of effects that have been inferred in the overseas economic literature. In the review that follows, we have focused on these examples, as they provide guidance on what ought to be subject to more detailed economic study.

4.1 Background

The RSE scheme was developed by the New Zealand government in close collaboration with industry, the World Bank, the Pacific Island Forum and Pacific Island countries.[118] It was introduced on 30 April 2007, following many previous seasonal work schemes.[119]

[114] Taylor et al. (2012); Charlton and Taylor (2016); Rutledge and Taylor (2019); Charlton (2019); Charlton et al. (2019a); Charlton et al. (2019b).

[115] For a review, see Underhill and Marsters (2017). Individual studies include: Ramasamy et al. (2008); Barker (2010); Gibson and McKenzie (2010); Bedford (2013); Gibson and McKenzie (2013); Bedford (2014); Gibson et al. (2014a); Gibson and McKenzie (2014); Winters (2016); Curtain et al. (2018); Bailey (2019); Nunns et al. (2019); Bedford et al. (2020); Nunns et al. (2020); Ministry of Business, Innovation and Employment and Ministry of Foreign Affairs and Trade (n.d.). For a more general discussion of the reasons behind the increasing popularity of guest worker programmes as migration shifts towards mobility and away from permanent settlement, see Angenendt et al. (2015).

[116] For example, the three impact studies recently produced for MBIE by Heather Nunns, Charlotte Bedford and Richard Bedford (Nunns et al. (2019); Nunns et al. (2020); and Bedford et al. (2020)) use contribution analysis, which, "provides a systematic and rigorous approach to establish (or inversely, to discount) a plausible association between a particular input (or group of inputs) and observed changes" (Bedford et al. (2020, p. 21)). This approach was adopted because, "Determining whether observed impacts can be *directly* attributed to RSE is impossible given the complexity of the policy, the number of stakeholders involved, the dynamic environment in which the scheme operates, and the range of Australian labour mobility arrangements operating simultaneously in the same [Pacific Island countries] and employment opportunity space" (emphasis in original). The econometric techniques we discuss in Section 2.2 are an alternative way of inferring causal relationships.

[117] Unfortunately, McLeod and Maré (2018) were unable to identify specific results for the RSE scheme due to technical challenges.

[118] Winters (2016) and Barker (2010).

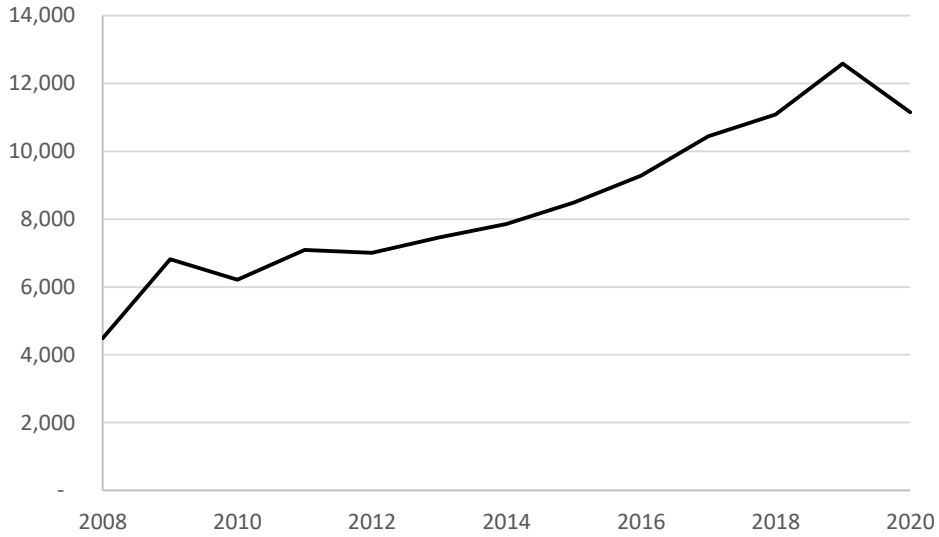
[119] Ramasamy et al. (2008).

The scheme has at least three separate stated objectives:

- to address seasonal labour shortfalls in the horticulture and viticulture sectors in a way that increases employer compliance with employment and migration law
- to provide access to an increasingly skilled pool of seasonal labour that returns each year, and
- to promote economic development in the Pacific region, primarily via remittances sent home.[120]

The RSE scheme has expanded over the years, growing from 5,000 places initially to 11,400 in 2019/20.[121]

Figure 7 The number of RSE workers has grown since the scheme was introduced



Source: Immigration New Zealand

Most RSE workers come from the five Pacific Island 'kick start' countries that were the target of initial facilitation efforts by the New Zealand government and local agencies: Vanuatu, Samoa, Tonga, Tuvalu and Kiribati.[122]

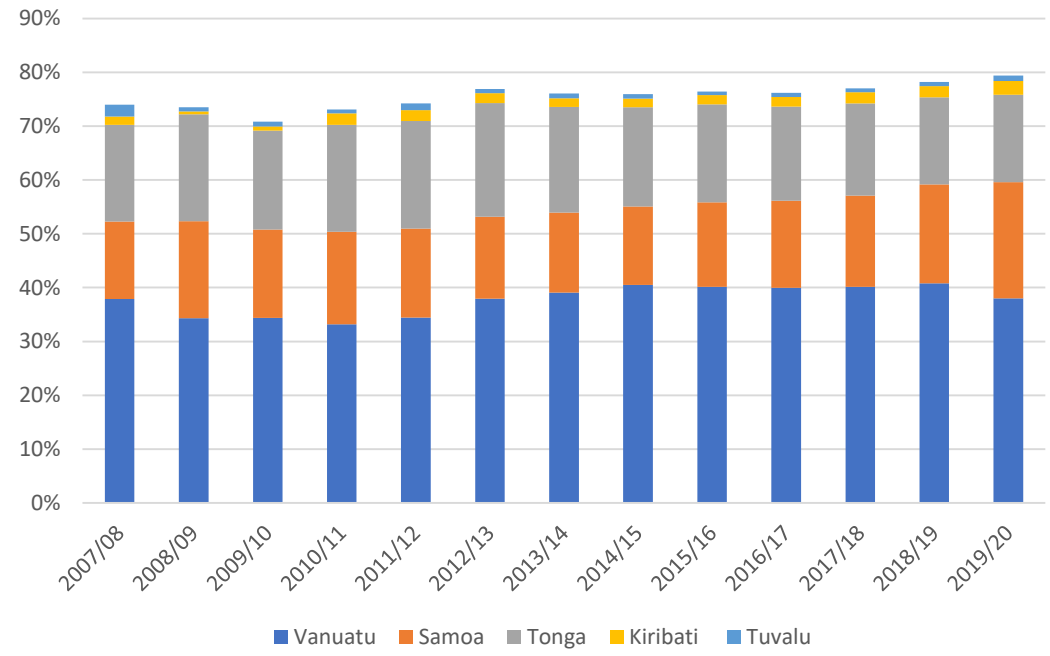
120 Gibson and McKenzie (2013).

121 Curtain et al. (2018) report that the RSE scheme supplies about 16 per cent of horticultural workers, while backpackers and migrant workers are 29 per cent, leaving 55 per cent of the workforce as locals. The reduction in RSE migrants due to COVID-19 will become clearer once data become available for the whole of the 2020/21 year.

122 Gibson and McKenzie (2014, p. 6).

Figure 8 Five countries are the major source of RSE workers

Proportion of total RSE workers from the five 'kick start' countries



Source: Immigration New Zealand

Before recruiting workers through the RSE scheme, employers need to demonstrate that they are committed to recruiting and training New Zealanders.[123] They may be required to show documentation showing they have advertised for New Zealand workers, or detailing steps taken to recruit New Zealanders in the past 12 months, or records of communications with Work and Income regarding recruiting New Zealanders. The intention behind these requirements is to put New Zealanders first when it comes to hiring.

Increasing RSE employment has occurred within the context of growth in the horticultural and fruit-growing sector. Real output in the sector in New Zealand has roughly doubled since 1991.[124]

An indication of the increased size of the sector can been seen in the national accounts. Table 1 shows four statistics from the sector: GDP, gross operating surplus (a measure of payments to owners of capital), compensation of employees and net capital stock. The labour share of income in this sector (the compensation of employees divided by GDP) has fallen sharply since 2010.

123 Immigration New Zealand (2019).

124 Statistics New Zealand (2021).

Table 1 The size of the horticulture and fruit-growing sector

$millions, nominal

	Gross domestic product	Gross operating surplus	Compensation of Employees	Net capital stock
2007	1,088	535	489	2,298
2008	1,088	459	559	2,566
2009	1,102	452	575	2,770
2010	1,087	421	587	2,744
2011	1,140	492	566	2,742
2012	1,219	560	571	2,833
2013	1,317	625	601	2,991
2014	1,561	888	578	3,169
2015	1,627	921	605	3,419
2016	1,833	1,081	646	3,659
2017	2,110	1,267	730	3,898
2018	2,067	1,228	722	4,331
2019	2,244	1,303	818	4,696

Source: Statistics New Zealand

At the same time, the area planted in various crops has changed, with large increases in plantings of kiwifruit and wine grapes, for example.

Table 2 Area planted has increased

Net area planted, hectares

Year	Apples	Kiwifruit	Wine grapes
2007	9,250	13,080	29,620
2009	9,280	13,290	33,420
2011	9,000	13,070	34,060
2012	8,850	12,760	34,560
2014	8,420	10,980	33,760
2017	8,600	11,700	34,000
2019	9,830	15,040	36,380

Source: Statistics New Zealand

4.2 Differences between RSE workers and locals

Workers entering New Zealand under the RSE scheme have different characteristics, motivations, experiences and alternative options when compared to locals.

Relative to local residents, including permanent migrants, RSE workers are likely to have fewer formal educational qualifications, and may have more limited English language skills. However, as discussed below, there is some evidence that RSE workers may be more skilled and productive than available local horticultural workers when it comes to doing the actual tasks they are employed to do. In most cases, RSE workers have no access to public income support[125] and their ability to work is subject to seasonal variability and weather conditions.[126]

Saving for remittances or to bring money home can be a priority for RSE workers. John Gibson and David McKenzie report that on average, individual RSE workers remit $5,500 each season, which makes a substantial contribution to improvements in their local communities.[127] Charlotte Bedford and Richard Bedford estimate hypothetical disposable incomes after remittances and report that half of RSE workers from Tonga had on average less than $40 a day to spend on discretionary items, including living costs, savings and items to take home.[128] This reduces the extent to which spending by RSE workers increases demand in the local economy.[129]

RSE workers must work for one (or a small number of) Recognised Employers and can only work for a limited period each year,[130] whereas permanent migrants can work year-round and have more flexibility to choose their employer.

The way the scheme is structured, participants unhappy with their current situation tend to either go home or not make a fuss: the perception is that those who complain won't be invited back.[131] Permanent migrants – and locals – facing similar challenges are much more able to change jobs.

As we discuss below, these elements influence the scheme's impacts on RSE workers, their communities at home, local workers and employers, and the wider New Zealand economy.

125 Exceptions have been introduced recently to minimise hardship caused due to COVID-19. See for example Immigration New Zealand (2020). In contrast, subject to residency and other requirements, permanent migrants can access financial support.

126 Richard Bedford and Charlotte Bedford give the example of groups of Ni-Vanuatu workers "who had to wait at least a fortnight after arrival for the sugar content of the kiwifruit they had been recruited to pick to reach the required level" (Bedford and Bedford (2017, p. 4)).

127 Based on a non-representative sample, Richard Bedford and Charlotte Bedford found considerable variability in earnings by island of origin. They reported median amounts remitted by Samoans ($5,939), Tongans ($5,737) and Ni-Vanuatu ($1,050) over approximately 21-22 weeks in 2014/15. See Bedford and Bedford (2017, p. 6).

128 Bedford and Bedford (2017, pp. 6-7).

129 But note that in the counterfactual case of no RSE migrants, the local economy would also not have benefited from expenditure on behalf of the migrants by their employers, for example on transport and accommodation.

130 Prior to COVID-19, visas were granted for a maximum of seven months in any eleven-month period (or nine-month period for residents of Kiribati or Tuvalu). As part of the New Zealand government's pandemic response, RSE visa holders in New Zealand when the country went into lockdown had their visas automatically extended (Lees Galloway (2020)).

131 Bedford et al. (2020, p. 52).

4.2.1 Why are RSE workers prepared to work under conditions that locals are not?

One of the main differences between RSE workers and locals is their employment alternatives. Local workers have access to a wider range of other job opportunities, and in many cases, public income support, whereas RSE workers do not.

RSE workers recognise that they have the potential to earn significantly more in New Zealand than they can at home. Even with the challenges involved, RSE opportunities are sought after. Workers know that there are many other people back home who would welcome the chance to work in New Zealand.

Compared to locals, RSE workers have very limited market power and cannot easily walk away from the wages and working conditions on offer. This means that, correspondingly, RSE employers will have more market power and can act as monopsonists.[132] Consequently, RSE workers often end up doing the most difficult work, including night shifts, and working very long hours:

> *Our employees are working long hours, most Saturdays and some Sundays, due to product urgently needing to be harvested due to shortage of pickers. This is a big concern for Health and Safety, and [the] wellbeing of our employees.*
>
> *The RSE workers are so willing to please and reliable. We would be lost without them. They turn up all days asked*.
>
> *We only employ RSE workers in the orchard for harvest…It is hard physical work.*[133]

RSE workers also face more stringent additional requirements than locals. Some employers require workers to stay at approved accommodation, keep curfews, or avoid drinking alcohol. These mandatory conditions are not negotiated with RSE workers[134] and breaches are often dealt with severely. MBIE's 2018 survey of RSE employers contained this example:

> *(Following drinking at the RSE accommodation): Warnings letters of Serious Misconduct were issued to 34 RSE workers stating that they were in breach of their employment agreement if they drink and that any breaches would result in them being sent home. We know there was only a couple drinking, however, it was not completely clear who did and didn't drink, so they were all warned. We had a good talk and discussion with them enlightening them to what could happen if it occurs again.*[135]

[132] Monopsonist employers – single buyers in a market – can depress wages because their potential employees have no alternative to taking the jobs and pay on offer. For a discussion of theories of monopsony and monopsonistic competition that can explain why this may happen, even in a seemingly competitive environment with labour mobility, see Hotchkiss and Quispe-Agnoli (2009). In the case of RSE workers, in the short term, their main option is not to come to New Zealand. We note, however, that the (uncapped) Australian Seasonal Worker Programme is increasingly an option. See Lawton (2019).

[133] Maguire and Johnson (2018, pp. 81; 84). New Zealand Apples and Pears business development manager Gary Jones told *Morning Report* that eighty per cent of pickers are migrant workers, while eighty per cent of packers are New Zealanders (RNZ (2020)).

[134] Some additional requirements, including curfews and limiting contact with local Pacific residents and churches, are developed by team leaders, who act as informal recruitment agents and liaison points between employers and RSE workers. See Bedford et al. (2020, pp. 50-51).

[135] Maguire and Johnson (2018).

Other employers reported people being sent home for drinking alcohol; not living in designated accommodation; unauthorised driving without a license; and using marijuana outside of work hours. One employer identified "husbands and wives wanting sleepovers when accommodation is for women only and men only" as a "character issue".[136]

RSE workers realise that disappointing their employers, either through poor work performance or activities after hours, can have consequences for others as well.[137] Fear of being perceived as disloyal or as "troublemakers", cultural respect for authority, and a tendency to "be shy and compliant in situations that are unsatisfactory, rather than asking questions or raising issues" can all prevent workers from raising concerns.[138]

Lack of clarity over rights and conditions is also an issue. Charlotte Bedford and her colleagues report instances of contracts changing after RSE workers have arrived in New Zealand.[139] As discussed below, there is considerable uncertainty over pay and piece rates and conditions[140] and RSE workers suspect that these are more favourable for local workers.[141] New Zealand's legal protections for health and safety apply to RSE workers but it is not clear that these are enforced consistently. Concerns over employment conditions of RSE workers have prompted the government to instigate a review of possible exploitation.[142]

Lower reservation wages may be one feature of the attractiveness of RSE employees: it is not just that they are 'better' workers; they are better workers who do not need to be paid the full value of their efforts. Potential local employees with similar traits, for example New Zealand-born Pacific people, might be less attractive to RSE employers because their ability to access a wider range of alternative employment options means that they would need to be paid wages that reflect their productivity.[143]

136 Ibid, pp. 64-65.

137 For example, Bedford et al. (2020, p. 50) note that the Samoan Government may place sanctions on the family or village of someone who was sent home, restricting their ability to participate in the RSE scheme during subsequent seasons.

138 Bedford et al. (2020, p. 52).

139 Bedford et al. (2020, p. 48).

140 Bedford et al. (2020, pp. 46-47) report that RSE workers would like greater certainty around how piece rates are calculated (and to know what they are before starting work); overtime rates and pay on public holidays; the amount of work that will be available over the term of the employment contract; and deductions.

141 Bedford et al. (2020, p. 47) note instances where "There were workers who questioned whether RSE workers got the same piece rates as working holiday makers and New Zealanders on casual contracts. There was a sense among some that higher rates were being paid to non-RSE workers to make the work attractive to them. There was no clear evidence of such differentials, but it was a suspicion among RSE workers that indicated a lack of clear understanding of how the piece or contract rate system works."

142 See Ministry of Business, Innovation and Employment (2020b).

143 Nunns et al. (2019, p. 46) note that "In the early years of the RSE scheme, some local Pacific communities were seen as a negative influence on RSE workers as they encouraged workers to change employers seeking better wages, move around New Zealand or overstay their visa. This has abated over time as a result of work done with Pacific communities informing them about RSE visa conditions and the penalties for workers who remain in New Zealand unlawfully."

4.2.2 Impacts on migrants and their home communities

From a development perspective, the RSE scheme has been lauded as an exemplary guest worker programme.[144] Illegal overstaying, which is frequently an issue with temporary migration, has been minimal, and participants have made substantial remittances that have contributed to significant improvements in their local communities: funding businesses, including cattle farms, shops and transportation services; paying for school fees; purchasing land; and building houses.[145] The Vakameasina training programme has helped participants to develop and enhance skills which can then be shared with extended family and communities back home.[146]

However, more recent reviews undertaken for MBIE by Heather Nunns, Charlotte Bedford and Richard Bedford identified some concerns over the economic value of the scheme to participants, and disparities over access to its benefits.[147] In particular, the authors reported that "the amount of income available to RSE workers to remit/save is being eroded due to RSE wages not keeping pace with rising accommodation and transport costs, and other living costs",[148] and noted access to seasonal jobs was unequal, both by gender[149] and across and within countries.[150]

Nunns and her colleagues also highlighted both intended and unintended consequences for families back home.[151] One negative impact of the scheme on home communities, which was anticipated when it was established, comes from the withdrawal of productive male labour in the 20-49 working age group for extended periods each season.[152] Unintended consequences include reduced family time, with the children of repeat returnees "missing significant periods of parenting year-on-year";[153] changing attitudes and behaviours that undermine "the practice of traditional values, leadership and governance at the village-level";[154] and the risk that "RSE workers, their families and communities could become

144 Barker (2010); Gibson and McKenzie (2013); Gibson et al. (2014); Winters (2016); Curtain et al. (2018).

145 Barker (2010).

146 Vakameasina is an RSE worker training initiative funded through the Ministry of Foreign Affairs and Trade. The programme provides "foundation-level training to new RSE recruits in English language, financial literacy and life skills, as well as more advanced training (e.g. in basic trades, leadership and small business management) to more experienced, return workers" (Bedford et al. (2020, p. 5)).

147 Nunns et al. (2019); Bedford et al. (2020); Nunns et al. (2020). The methodology in these reviews was based on extensive interviews with participants, which allows for a more granular examination of impacts that might not be apparent from research looking at averages.

148 Bedford et al. (2020, p, 6).

149 Nunns et al. (2020, p. 8).

150 Bedford et al. (2020, p. 6).

151 We note that the decision to take part in the RSE scheme is a voluntary one on the part of the workers. Like all migrants, they have made a conscious choice to move, albeit on a seasonal basis, to New Zealand in pursuit of better opportunities than they have at home. That choice may be constrained by limited alternative options for waged employment, particularly in rural areas in the Pacific Islands, and comes at a cost of leaving behind family and friends, being immersed in a different culture and undertaking hard physical labour. The theories of immigration that economists use would imply that these workers are receiving more in benefits than they incur in costs. It is a general proposition of modern economics that people, even when they have limited information and are prone to mistakes, are able to judge what is good for them and that the choices they make should be respected, provided these choices are freely made and do not adversely impact others (have negative externalities). The extent to which these choices are freely made will also depend on the balance of power between employers and migrant workers: as the discussion in Section 4.2.3 indicates, RSE workers and researchers perceive there to be some distinct imbalances.

152 Nunns et al. (2019, p. 45).

153 Bedford et al. (2020, p. 6).

154 Ibid.

dependent on the waged employment provided by the RSE scheme rather than developing ways to build a sustainable income at home".[155]

The authors stress that these negative impacts are not yet sufficient to dissuade prospective RSE participants, and that they cannot be generalised across all countries or communities.[156] They recommend continual oversight of, and support for, interested parties in order "to ensure the policy's objectives are kept in balance in future".[157] This focus on balance reinforces the point that the RSE scheme has multiple objectives, of which providing direct financial benefits to workers and their communities is an important one. Any modifications will need to be made carefully so as not to negate the clear benefits the scheme provides.

4.2.3 Wage and employment impacts – migrants

More accurate information on the wages, hours, and conditions of both RSE workers and locals is needed before robust conclusions can be drawn about impacts. Clearly, many RSE workers can earn considerably more in New Zealand than at home, hence the attraction of the scheme.[158]

Heather Nunns and her colleagues state that:

> *The greater productivity of RSE workers, compared to other types of seasonal workers (e.g. NZ casuals, W&I clients, backpackers) is reflected in higher wage rates for RSE workers. A recent survey commissioned by NZAPI (2018) which contains earnings data for key tasks performed in the pipfruit industry (picking, pruning, thinning, packing and maintenance jobs) shows RSE workers have higher weighted average hourly earnings for picking, thinning and pruning – all tasks paid on piece rates (per bin filled, or per tree/vine thinned or pruned) – compared to other worker groups.*[159]

The authors also discuss in some detail concerns that RSE workers have about their wages and other employment conditions. The issues raised include:

- The overall level of wages, especially through time and how they compare with living costs both at home and in New Zealand, and
- Whether more efficient workers are paid more (in total, per hour or by piece rates).

A related question is whether deductions for employer-provided accommodation, food and transport are cost-reflective.[160]

[155] Nunns et al. (2019, p. 69).

[156] This is because negative affects "are context-specific and depend on a range of influencing factors such as the numbers of RSE workers relative to the size of the community's (usually a village) population, and the length of time members of the community have participated in the scheme" (Nunns et al. (2019, p. 6)).

[157] Nunns et al. (2020, p. 36).

[158] John Gibson and David McKenzie report that many RSE workers come from a rural background, with subsistence farming being a common occupation. See Gibson and McKenzie (2014, p. 24).

[159] Nunns et al. (2019, p. 47).

[160] Ibid.

Some of these concerns arise from a lack of participant clarity around what RSE policy requires, and some result from the policy itself. For example, employers are required to make sure that workers are paid the market rate for work,[161] and for agreements that last six weeks or longer, there are minimum hours requirements.[162] But some employers average out earnings over the term of the contract. Rather than being employed for at least 30 hours every week, RSE workers can experience weeks where they do not work at all, alongside other weeks where they work a great deal. The financial benefits of highly productive work weeks are diluted by the practice of averaging hours across working weeks. As Charlotte Bedford and her co-authors point out in another recent review for MBIE:

> *This practice undermines the incentives associated with piece rates which reward workers for quick, accurate work. Workers' financial rewards for hard work on dry days when crops are ready to be picked are offset by wet days when they are unable to work or on days when there is a limited number of hours' work available due to crops being unready to harvest.*[163]

It also has implications for the wellbeing of migrant workers. Neither spending weeks in communal accommodation without work or opportunities to socialise nor working excessive hours are ideal.[164]

4.2.4 Wage and employment impacts – locals

Two reports for MBIE by Keith McLeod and Dave Maré provide considerable reassurance about temporary migration impacts in New Zealand. These studies used data from the Statistics New Zealand IDI to examine the impact of temporary migration on local labour market outcomes.[165] They also examined impacts on high-risk subgroups (young people, and people receiving an income-tested benefit while looking for work).

[161] Immigration New Zealand (2019, p. 2).

[162] RSE workers must be paid for either an average of 30 hours per week, "at the 'per hour' rate for the period worked or payment", or "for 240 hours at the 'per hour' rate, regardless of the actual availability of work", whichever is greatest. See Immigration New Zealand (2019, p. 5).

[163] Bedford et al. (2020, p. 119).

[164] Bedford et al. (2020, pp. 47-48) provide examples of downtime, with workers still having to pay accommodation and living costs for weeks at a time when there is no work at the start or end of the season. One former RSE worker said that in 2015, workers based in Motueka had to borrow money from back home to cover their costs while waiting three weeks for picking to start. In another case, Fijian women who were only able to work half days during the 2018/19 strawberry season ended up with negative pay slips, once deductions for transport, meals and accommodation were made. At the other extreme, the authors also describe instances of workers doing 12-13-hour days, from 6 am–7 pm, six to sometimes seven days a week, while undertaking physically demanding work like thinning kiwifruit.

[165] Because migrants are attracted to regions and industries with positive employment prospects, temporary migrant employment and employment outcomes of New Zealanders are likely to be positively correlated. Using econometric modelling techniques to account for common factors and selection bias, McLeod and Maré estimated the **causal** impact of temporary migration on the employment outcomes of New Zealanders (McLeod and Maré (2018, p. 3)).

The first report, published in 2013, did not find any evidence of adverse consequences for the employment of New Zealanders overall. The authors also concluded that temporary migration was "unlikely to have caused any significant negative impact on earnings of New Zealanders or temporary migrants".[166] However they noted that the research largely examined a period of economic growth, and cautioned that "the possibility of negative impacts in the future should not be discounted, particularly if temporary immigration settings were relaxed."[167]

The follow-up report, published in 2018, examined migrant employment from 2000 to 2015. This timeframe included "a period of rising temporary migrant employment coupled with strong economic growth, a period that includes the global financial crisis and the subsequent downturn, and the period from 2011 where temporary migration and temporary migrant employment has increased rapidly again and reached higher levels than previously seen."[168] It updated the earlier analysis and provided additional detail on impacts in different subgroups, industries and regions.

While the overall conclusions were consistent with those from the earlier study, the authors found some differences in results by industry, population subgroup, time period, location and visa type. For example, in main urban areas, positive direct impacts on beneficiary hires and positive direct and indirect impacts on hiring young people were identified. Outside main urban areas, and in horticultural regions, temporary migration had negative impacts on beneficiary hires. In earlier periods, there were negative impacts on beneficiary hires; in later periods, there were positive effects on youth hires. Temporary migrants increased hires in the food service industry for every group except beneficiaries, for whom there was no impact on hiring. Essential skills visa holders had negative effects on hiring New Zealanders as a whole.[169] This study provides a vivid illustration of the effects that local circumstances can have on empirical results.

Unfortunately, the authors were unable to directly examine RSE scheme impacts due to poor instruments. Other research techniques also face challenges. As John Gibson and David McKenzie note:

> *Ideally one would like to compare the employment of New Zealand workers relative to a counterfactual of no RSE. Business cycle and annual changes in growing conditions mean that simply comparing their employment prior to the RSE to that after will not give the causal impact of the program.*[170]

However, it is possible to draw some inferences based on surveys of employers who hire temporary workers via the RSE scheme.

[166] Despite finding that "The impact of temporary migrant employment on the earnings of both New Zealanders and temporary migrants was positive, significant and similar in magnitude to the impact on employment", the authors cautioned against "over-interpreting" this finding because "compositional changes in local industry employment could result in positive effects that are spurious" (McLeod and Maré (2013, p. 43)).

[167] McLeod and Maré (2013, p. iii).

[168] McLeod and Maré (2018, p. 3).

[169] Ibid, pp. 34-35.

[170] Gibson and McKenzie (2014).

First, it is clear that, despite requirements to hire New Zealand workers first if they are available and willing to work, many employers prefer to hire RSE workers for particular jobs. This reflects perceptions around the availability of New Zealand workers, and the relative productivity and reliability of RSE workers. MBIE's 2019 survey of RSE employers reported that:

> *[Ninety-eight per cent] rated [RSE workers] positively for their enthusiasm compared with 10% of new workers sourced from Work and Income. Ninety-six percent rated them positively for their dependability compared with eight percent of workers from Work and Income, and 94% rated them positively for their productivity compared with nine percent of new workers from Work and Income.*[171]

Even when firms go to considerable effort to try to hire locals, they may still be unsuccessful.[172] Moreover, many RSE employers say they find New Zealanders to be unavailable, unreliable, unwilling or unable to do certain tasks and jobs. Comments included in MBIE's 2018 survey of RSE employers include:

> *Horticulture isn't a desirable industry and the younger generation are more interested in the digital industries or professional career paths.*
>
> *It has become a 'lifestyle' for some Kiwis to not work (and receive the benefit)! Why would they want to work hard to earn money when they are getting a benefit anyway?*
>
> *People from Work and Income are never any good.*
>
> *Local people do not want to work and the majority cannot pass a drug test.*
>
> *Half of my workforce is totally unreliable, cannot turn up on time, just walk off any time they feel and do not show up but never contact to say they are away.* [173]

In part, these comments reflect the dynamic described by J Edward Taylor and Diane Charlton: as economies develop, local workers are likely to be able to access better work options outside the agricultural sector, and will be less available for farm work.[174] People who are not able to take up other roles may have particularly strong ties to a local area or have suffered disadvantages that have prevented them from acquiring sufficient human capital to be productive horticultural employees. Locals will also have higher reservation wages due to being able to access benefits and other jobs, which under the conditions of their visa, RSE workers generally cannot.

171 Research New Zealand (2019, p. 6).

172 For example, New Zealand Kiwifruit Growers Incorporated reports a range of efforts designed to improve worker welfare and increase the attractiveness of roles. These include planning for increased accommodation and transport; working with the Ministry of Social Development to identify and employ New Zealanders; and offering more flexible work conditions (including part-time work), more reliable work hours, and extended seasonal work contracts. Despite also working with schools and tertiary institutions to expand training, qualifications and pathways into the kiwifruit industry and investing in labour-saving research and technology, the industry estimated that growers were short by 1,400 workers at the beginning of the 2019 season. Industry research predicts a further 8,000 seasonal workers will be needed by 2027 (New Zealand Kiwifruit Growers Incorporated (2019, p. 1)).

173 Maguire and Johnson (2018, pp. 57; 81-82).

174 Taylor (2010) and Charlton (2019).

It is possible, therefore that the terms of the RSE scheme may be creating a type of regulatory subsidy for employers. That is, the conditions under which RSE workers can enter and work in New Zealand prevent them from seeking wages that match their true productivity **in New Zealand**. If, for example the exact same workers who are currently in New Zealand on an RSE visa were instead granted a visa that gave them general work rights, they may be able to command higher wages because they could credibly point to higher-earning alternative employment options elsewhere.[175]

As Box 1 on the following page demonstrates, faced with reduced access to seasonal labour due to the COVID-19 pandemic, growers have hired more New Zealand workers.

We note, however, reports that this has necessitated an increase in wages and improvements in other conditions. This supports our view that the lower reservation wages of RSE workers is a factor to be investigated, as it suggests at least some prior displacement of New Zealand workers could have occurred.

Consistent with the overall econometric results found by Keith McLeod and Dave Maré,[176] alongside indications of possible displacement, there is also evidence of RSE employers hiring more New Zealanders. In the 2019 RSE Employer Survey, 82 per cent of employers who have employed Pacific RSE workers report being able to employ more New Zealanders as a consequence, and so did 68 per cent of non-RSE employers.[177]

How does this dynamic work? Essentially, employers are describing complementarities been local and RSE workers. Every 'official RSE' employer agreed that participation in the scheme resulted in a more stable seasonal workforce (100 per cent) and almost all agreed that it resulted in better quality and more productive workers (99 per cent).[178]

In comments provided to the researchers and reproduced in MBIE's 2018 RSE survey, employers highlighted the benefits of reliable RSE worker attendance throughout the entire season. A dependable team of RSE harvesters enabled a full complement of New Zealand packhouse staff to be hired. Harvesting fruit in premium condition increased returns, which could be reinvested in the business. As production expanded, skilled New Zealanders would be needed to train, supervise, quality control and drive tractors for the larger seasonal crews required, enabling growers to develop the skills of locals and provide year-round employment.[179] Business models are being built on the regular and predictable flows of RSE workers.[180] Without these workers, the considerable depopulation and population ageing resulting from agricultural holdings becoming larger and outward migration of young people to metropolitan areas might accelerate.[181]

175 This is a hypothetical example: this type of visa does not currently exist in New Zealand.

176 McLeod and Maré (2018).

177 Research New Zealand (2019, p. 36). The report does not provide a detailed breakdown of the actual numbers of employees.

178 Ibid, p. 32.

179 Maguire and Johnson (2018, p. 81).

180 We thank Bill Rosenberg for this point.

181 In other words, demographic changes create negative externalities for local communities that need to be addressed, and in this context, the RSE scheme provides a positive externality for local communities. A reduction in numbers of workers entering New Zealand through the RSE scheme might accelerate depopulation. We thank Jacques Poot for this point.

Box 1 Local agricultural workers and COVID-19

Following the closure of the New Zealand border in response to the COVID-19 pandemic, concerns were expressed about an expected shortfall of horticultural workers.

A common concern was that without access to temporary seasonal migrant workers, crops simply would not be picked.[182] AUT lecturer Swati Nagar wrote:

> *As we head into peak harvest time, growers can only watch and wait as NZ$9.5 billion worth of fruit and vegetables go unpicked and risk rotting in place.*
>
> *If this summer's crops quite literally go to the birds, then farms may go under, families will suffer and consumers will see the price of seasonal produce skyrocket.*[183]

There was considerable media commentary indicating that New Zealanders either didn't want to take fruit picking jobs, or weren't up to it. Gary Jones, business development manager for New Zealand Apples and Pears, told Radio New Zealand that Kiwis "don't necessarily want to travel around regions, working for a few weeks in a seasonal industry" and that "money isn't always the answer". Picking fruit is tough work, involving "heavy lifting and a lot of climbing, which not everyone is able to do".[184]

Orchardist Nigel Hinton also said that the work ethic of unemployed New Zealanders was very different from that of people coming to New Zealand under the Recognised Seasonal Employer scheme:

> *The RSE workers come here because they want to work, they need the job and they use the money they do earn for their family in their villages back home ... Dare [I] say it... a lot of Kiwis haven't got any work ethic at all and they don't want to work.*[185]

Contrary to expectations, substantial numbers of New Zealanders indicated a willingness to pick fruit. Michael Andrew, Business Editor at the Spinoff, said some of this was driven by improvements in terms and conditions:

> *They're offering free food, discount accommodation, and better pay, with one owner saying a good picker can earn a whopping $400 a day in peak season.*[186]

There were some reports of New Zealanders who were prepared to pick fruit not being hired. Jacob McSweeny reported complaints from locals who had tried to apply for fruit picking jobs in Central Otago and hadn't received responses from growers. A Dunedin woman who was seeking cherry-picking work after being made redundant, fumed:

> *I just feel like they've got this preconception about Kiwis and their work ethic and I think... they're saying they're desperate, they're not hiring Kiwis and then they're trying to get people in they want to pay less.*[187]

At the time of writing, seasonal fruit such as cherries are being picked, and local prices are not elevated. However, it is difficult to draw a counterfactual relative to 'normal' years: reduced access to other jobs due to COVID-19 may have made New Zealanders more willing to take on seasonal work, and severe weather events (see footnote 100) that have damaged crops and reduced the demand for workers. And the apple and pear harvesting season is yet to come.

182 TVNZ (2020).

183 Nagar (2020).

184 RNZ (2020).

185 McSweeny (2020).

186 Andrew (2020).

187 McSweeny (2020).

4.2.5 Two-tier labour markets

Two-tier labour markets can emerge when different people doing fundamentally similar jobs experience different wages, conditions, or enforcement of entitlements and protections.[188]

Two-tier labour markets are more likely to occur when:

- Some workers have different **reservation wages**, for example because they have limited alternatives to their current role.
- Workers vary in the degree of **market power** they can assert, for example migrant workers with work rights tied to a single employer are less able to use the threat of resignation in wage negotiations.
- Some employees are less sure of their **rights**, perhaps due to communication or cultural differences, or where terms and conditions are unclear.
- **Enforcement** of employee rights is challenging or insufficient.

Different countries take different views on whether tiered labour markets matter. Particularly in cases where labour shortages exist alongside ready access to illegal workers, there can be a tendency to look the other way.[189] Implicitly, the view is that as employers and employees have both willingly entered into a mutually beneficial contract, it should be respected, especially given the alternative of poor employment options at home for the workers.

New Zealand presently takes the view that labour market protections should be consistently and robustly enforced.[190] In part, this is a moral argument: if one group of labour market participants deserves protection, so do others. In part, it is a practical one: failure to consistently enforce protections has the potential to lead to a 'race to the bottom' when it comes to wages and conditions. Increasingly, it is also likely to reflect a pragmatic acknowledgment of the expectations of consumers in export markets.[191]

Specifically relating to the RSE scheme, Heather Nunns and her colleagues note the increasing use of third-party certification of production practices in response to rising consumer expectations around environmental and social responsibility. Closer scrutiny of the labour practices of both organisations and their supply chains has emerged from a range of institutional measures, including Global GAP and GRASP (which include human welfare standards), and Modern Slavery Acts in the UK (in 2015) and Australia (in 2018).[192]

188 For a theoretical discussion of such markets in agriculture, see Eswaran and Kotwal (1985).

189 For example, Taylor (2010) estimates that in 2005-2006, a period of relatively slack enforcement of the border between the United States and Mexico, 73 per cent of California's farm workforce was illegal.

190 MBIE is currently leading a policy and operational review of Temporary Migrant Worker Exploitation in New Zealand. See Ministry of Business, Innovation and Employment (2020b).

191 The New Zealand Institute of Directors has raised the impact of the UK Act on New Zealand firms with its members (Reid (2017, p. 22)).

192 Nunns et al. (2020, p. 7).

4.3 Capital effects

We now turn to the evidence on the effect of seasonal migration on the capital used by New Zealand growers.

Again, the available information is limited.

Ganesh Nana, Kel Sanderson and Rob Hodgson simulated the macroeconomic impacts of increases in immigration on the New Zealand economy using a computable general equilibrium (CGE) model in 2009. Unfortunately, they did not examine the impacts of an increase in low-skilled immigration. The Nana model assumes capital increases in response to increased labour supply in order to maintain the capital labour ratio. GDP per capita increases when immigration increases, because immigrants are more likely to be of working age than locals. Increasing competitiveness via lower wages induced through increased labour supply from immigration is an important driver of the model's results. Additional economic activity is skewed towards relatively labour-intensive industries such as tourism, which benefit from the lower wages associated with increased labour supply.[193]

In an earlier CGE study published in 1988, Jacques Poot, Ganesh Nana and Bryan Philpott examined a scenario with an increase in households from a Pacific Island background.[194] Compared to a migration scenario with the same percentage increase in households but from throughout the world, this yielded both greater population growth (due to larger average household size) and, assuming – as in the 2009 study – an increase in capital equal to the increase in labour supply, greater aggregate demand and productivity growth.[195] However, the increase in productivity growth was lower than in another scenario where additional migrants had higher average levels of education.[196] The Pacific Island migration scenario is not directly comparable to the RSE scheme, which only permits temporary entry for individual workers from Pacific countries, but it does quantify what could happen in the case where less-skilled migration increases both capital use and productivity.[197]

Given the time that has elapsed since these studies and the extent of subsequent changes to the type and scale of temporary migration flows, updated CGE analysis that explicitly examines changes consistent with increased flows of RSE (and other temporary) workers would be very helpful.[198]

193 Nana et. al. (2009, p. 30).

194 Poot et al. (1988, chapter 5).

195 The CGE modelling calculated the effects of various migration scenarios relative to a baseline scenario of zero net migration.

196 Ibid, Table 5.14, p. 119.

197 As discussed in section 2.4.3, whether capital and productivity **actually** increase in response to increased migration depends on specific local circumstances.

198 We also note that the CGE models available in New Zealand have developed considerably since these studies were conducted. For example, NZIER now has CGE models with much greater geographical and industry granularity than those cited above. See Leung et al. (2020).

4.3.1 Impacts at the firm level

Few New Zealand studies examine influences on capital and automation at the firm level.

As noted in Section 2.4.3 above, low-skilled, temporary seasonal migrants can increase the local demand for capital in certain circumstances. MBIE's 2019 survey of RSE employers reported that "eighty percent of 'official RSEs' stated that, as a result of having a stable workforce, they had been able to invest in plant and equipment".[199] However, a breakdown later in the report makes it clear that only fifty-five per cent of employers had invested in plant and equipment this year, with others planning to make changes next year.[200]

A more realistic impression of the trend is provided by the 2019 RSE impact study undertaken for MBIE by Heather Nunns, Charlotte Bedford and Richard Bedford. Between 2012 and 2018, they report an increasing percentage of survey respondents indicating they had invested in new plant and equipment in the past 12 months, "up from around 25 percent in 2012 to around 50 percent in 2018."[201]

These more modest figures are still impressive. But examining comments provided by respondents in the 2018 report paints a more nuanced picture. One respondent identifying a new multi-million-dollar post-harvest development as "a direct result of the "RSE factor"" explained, "A stable workforce means we have the confidence to increase our plantings further, which means we need additional cool storage, tractors, sprayers, etc. to grow/manage the crop".[202] The implication is of RSE workers enabling greater scale, rather than greater labour productivity.[203] While from the perspective of a firm increasing the size of operations may appear to be beneficial, from a national perspective a more-than-proportional gain in output proportional to the level of increased inputs of labour and capital is needed for productivity to increase.[204]

199 Research New Zealand (2019, p. 8). In the 2018 RSE survey, several respondents spoke of compliance or health and safety as a key motivation for investing in new plant and equipment, or referred to increased investment in housing for workers (Maguire and Johnson (2018, pp. 73; 89)).

200 Research New Zealand (2019, p. 11).

201 Nunns et al. (2019, p. 49).

202 Maguire and Johnson (2018, p. 85). Nunns et al. (2019, p. 27) also report "significant flow-on effects for the local construction industry, engineering firms and technology suppliers".

203 If producers have fixed costs, then increasing the size of planting would reduce average costs of production. This is, however, unlikely to lead to an increase in labour productivity (output per hour worked). It might lead to an increase in total factor productivity, which is measured as any increase in production that is not explained by an increase in factors of production. In the case of horticulture, much would depend on whether land is included in the definition of capital.

204 For example, if labour and capital employed by a firm are each increased by, say 25 per cent and output increases by 25 per cent as a result, from a national perspective, output per hour worked (a common measure of labour productivity) has remained constant. While more people may have been employed, average wages would not have increased. We note that much of the literature that we reviewed in Section 2.4 assumes constant returns to scale, in which the return to capital is independent of scale. It is likely that observed consolidations of holdings are linked to greater capital intensity and total factor productivity, rather than returns to scale *per se*. We thank Jacques Poot for this observation.

A key question we are unable to answer is what would have happened to capital and automation at the firm level in the absence of RSE workers and other temporary workers, that is, what is the counterfactual. As noted in Section 3.1, there have been much larger increases in temporary migrants with work rights through the Working Holiday scheme, and through increasingly granting work rights to rising numbers of migrant students. We lack both direct and indirect evidence on their impacts.

Whether an increase in low skilled seasonal migration leads to increasing capital intensity and automation or increasing labour intensity depends on a range of factors, including the price and availability of capital, how quickly local businesses and the local economy adjust to increases in labour supply, the preferences of business owners, and the available alternatives.

For individual growers, RSE workers and other temporary migrants can expand or reduce the use of capital in the short term, depending on individual business circumstances. While robotic fruit picking is being developed and trialled in New Zealand, some growers are introducing less-expensive innovations that support low-skilled labour. [205] One example of this practice is using mechanised platforms rather than ladders to pick fruit.[206]

Longer term, international experience suggests that in the absence of readily accessible alternative sources of workers, productivity-enhancing alternatives to labour and skill shortages – such as improving education and training, and increasing automation – are more likely to occur.[207] However, that is not to say these changes necessarily **will** occur. Other responses observed overseas in response to shortages of legal low-skilled labour are increased use of illegal labour, growing different crops that are less labour-intensive and growing smaller quantities of labour-intensive crops.[208]

More recently, in addition to expanding scale, capital investment and automation in the New Zealand horticulture sector has tended to concentrate in areas which can potentially operate year-round, such as pack houses. While automated technologies for picking, packing and pruning some fruit and nuts are already available or being developed, major advances in automation are not expected to be applied in New Zealand for another five to ten years. Heather Nunns and her colleagues attribute this timing primarily to the costs involved.[209] There are also technical challenges to be overcome before full robotic harvesting is possible in real-world environments.[210]

The Californian tomato industry gives an indication of how these elements can interact and influence not just the market and its participants, but also migration policy.[211]

[205] Fei and Vougioukas (2021).

[206] Horticulture New Zealand et al. (2020).

[207] In Fry and Wilson (2020) we discussed another possibility for increasing the supply of labour: improving the education system in order to train more suitable locals. This does not apply here, since by definition unskilled labour requires very little training. As an indication, three quarters of growers employing official RSE workers report it taking between a day and a week to train new workers, with the remainder saying it takes more than a week (Maguire and Johnson (2018, p. 29)).

[208] Taylor (2010).

[209] Nunns et al. (2019, p. 32).

[210] Hua et al. (2019).

[211] As emphasised throughout this report, it is not possible to draw direct inferences for New Zealand from other situations. But the use of migrant labour to grow fruit and vegetables in California is much studied, and enables us to get a sense of the range of possible outcomes we might find in New Zealand if similar work was undertaken. On the issue of co-ordination across crops, New Zealand has existing initiatives and platforms such as https://www.picknz.co.nz/work-opportunities/work-planner/ and https://www.seasonalstaff.co.nz/ which could be built on.

Box 2: The case of Californian tomatoes

One central element of migrant labour in the United States was a series of 'bracero' (Spanish for 'manual labourer') programmes operated by the US Government, with co-operation from Mexico.

The first bracero programme was implemented in 1917 to replace seasonal workers who entered the military or shifted into wartime industries. The main programme operated from 1942 to 1964, under which some 4.5 million Mexican workers were granted entry to the United States.

J. Edward Taylor identified a series of developments that demonstrated the availability of substitutes for imported workers.

The first was the emergence of the United Farm Worker (UFW) union, founded by Cesar Chavez. The UFW obtained substantial improvements in the wages and working conditions of Californian farm workers in the 1970s, thus encouraging increases in the supply of local labour.

The second was the very successful development of labour-saving mechanisation of tasks that had previously been predominantly performed by the bracero. As Taylor reported:

> *The percentage of the processed-tomato crop harvested by machine rose from nil in 1960 to 100% in 1975. This achievement required collaboration between crop scientists and mechanical engineers at the University of California. It was accompanied by increases in labor productivity in other crops, as farm wages began to rise faster than nonfarm wages. Some economists predicted that mechanical harvesting would replace hand harvesting in the United States "within a decade".*[212]

New labour management practices also played a part. These innovations meant farmers could produce the same amount with fewer workers, enabling them to pay higher wages and offer more generous conditions.[213]

John Mamer and Donald Rosedale showcased the effect of the activities of the Coastal Growers Association (CGA), which recruited workers and synchronised their activities across member farms. The CGA managed to reduce picker numbers from 8,517 in 1965 to 1,292 in 1978, paying average wages that were more than twice the minimum wage at the time, as well as offering benefits that included health insurance, paid vacations, and subsidised housing.[214]

Although research demonstrated significant social benefits from mechanisation, not everyone approved.[215] The University of California was sued by the UFW and California Rural Legal Assistance on the basis that "publicly funded mechanization research displaces farm workers, eliminates small farmers, hurts consumers, impairs the quality of rural life, and impedes collective bargaining."[216] The case was settled but the resulting negative publicity led to reduced public funding for research into labour saving techniques in agriculture, and both unionisation and mechanisation were side-lined by increasing illegal immigration in the 1980s.

212 Taylor (2010, p. 380).

213 Taylor (2010, p. 381). More recent econometric research by Clemens et al. (2018) has shown that the exclusion of bracero workers **itself** did not substantially raise wages or employment for local workers. They do, however, confirm the finding reported by Taylor that employers responded to reduced labour supply by automating. San (2020), using a more direct approach, confirms Clemens et al's automation result.

214 Mamer and Rosedale (1981).

215 Schmitz and Seckler (1970, p. 569) found that gross social gains from research and development expenditures on the tomato harvester were "in the vicinity of 1,000 percent".

216 Taylor (2010, p. 381).

4.4 Productivity of local firms

Bringing together influences on labour and capital impacts, it is clear that access to RSE employees can influence the productivity of local firms in various ways.

4.4.1 Short term productivity impacts

The limited available evidence suggests that there are productivity differences between RSE workers, locals, and other temporary seasonal migrants.

If local workers are as productive as migrant workers, but simply less prepared to work because they have higher reservation wages, then employers may be able to achieve a cost advantage from employing migrants. As demonstrated in Sections 4.3 and 4.4, survey evidence from employers, a review of the RSE scheme for MBIE and post COVID-19 border closure outcomes suggest that this reservation wage-generated substitution effect could be occurring in New Zealand.

Of course, employers may prefer to substitute certain low-skilled migrant workers for low-skilled New Zealand workers because some migrant workers are more productive. In this case, migrant workers can boost short-term firm productivity directly, and also indirectly through the kinds of complementarities with skilled local workers outlined in Section 4.2.4 above.

Measuring productivity of workers at the firm level requires data that is sufficiently granular to allow other factors, like the weather, the type of capital employed and fruit quality, to be considered. As John Gibson and David McKenzie note, ideally a counterfactual of no migrant employment should be compared.[217] They report the difficulties they had in collecting suitable data for their study of the RSE scheme.[218] In the end, they could only present case study (that is, no counterfactual) evidence from two orchards, one growing citrus, the other apples. In the citrus case, they found that productivity of RSE workers increased with the number of years they returned. For the apple orchard, they found the same increase in productivity in returning workers as well as evidence that RSE workers were more productive than New Zealand contract labour, casual labour, and backpackers.

Charlotte Bedford conducted a similar case study in 2011, looking at around 200 seasonal employees – a mix of RSE workers, regular locals and casuals (backpackers, students, referrals from Work and Income) – working during the apple harvest on a single orchard in Hawke's Bay.[219] She measured productivity using average earnings over twelve weeks, on the basis that the employees were entirely paid on piece rates.[220] Her results were that:

- Productivity of returning workers, both RSE and regular locals, increased with experience.
- RSE workers and locals had significantly higher earnings than causal workers.
- RSE workers were more uniformly productive, with less variability of earners. This applied to both new workers and returnees.

[217] Gibson and McKenzie (2014, p. 15).

[218] Ibid, p. 18.

[219] Bedford (2014).

[220] What those rates were or whether they were the same for all workers was not recorded.

Reflecting the findings reported in Section 4.2.2, Bedford reports that the increasing productivity of returning RSE workers creates tensions in home communities. New Zealand employers prefer returning workers, but this means that the benefits of participation in the RSE scheme are concentrated in a few workers as are the social costs of absence.[221]

Separating out the extent to which New Zealand employer preferences for RSE workers are due to lower cost or higher productivity is not possible with current data.

4.4.2 Longer term productivity impacts

Longer term, the productivity impact of how employers respond to a changed supply of labour with changes to capital and automation is an unanswered empirical question.

Increasing consolidation of the horticulture industry is occurring alongside growing demand for labour. Even if smaller growers delay automation due to increased accessibility of legal low skilled labour, the scale of consolidation in the industry is such that this impact might not easily be observed.

As we noted above, output in the horticulture sector has increased, as has the area planted in certain crops and the amount of capital employed. An important question is whether this increase in resources has resulted in an increase in productivity. Again, the counterfactual is important. If the increase in resources (capital, labour and land) has been the result of shifts from other, less productive uses, then overall productivity may have increased.

Some growers are bringing in automation that complements a more reliable labour force, such as mechanical platforms. Some larger corporate growers are both increasing investment in automation, and adopting new planting systems with future automation in mind.[222] The expectation is that, rather than replacing people entirely, this automation will be used alongside different, more skilled types of labour in future in order to boost productivity.[223] However, there are also concerns that large scale growers are expanding with the assumption that they will be able to access ongoing increases in labour supply, without giving enough consideration to pressures on local infrastructure (accommodation, roads, wastewater) and services (such as medical services).[224]

4.5 Findings

Studies suggest that the RSE scheme is world class when it comes to its development goals. Compared to other aid programmes, the RSE scheme provides residents of sending countries with substantial incomes and skill development opportunities compared to what is available locally, albeit with some costs to the families and communities left behind.

Regarding RSE workers, rising accommodation costs, stagnant wages, some questionable employer practices and unanticipated wellbeing costs for families are evident, but participation in the scheme is still highly sought after.

Employers are enthusiastic supporters of the scheme. They attribute increased investment in plant and equipment and improved opportunities for local workers to the greater

221 Bedford (2014, p. 85).

222 Horticulture New Zealand et al. (2020).

223 Although note that the prime motivation of the grower will be to increase profitability, rather than productivity.

224 Nunns et al. (2020, p. 32).

certainty provided by RSE workers. Employers prefer RSE workers because they are perceived to be more reliable, better able to manage the physical requirements of the job, and more productive. In the short term, the limited available information suggests that RSE workers are indeed more productive than other temporary migrant workers and locals, and that returning RSE workers continue to increase their productivity over time. This relative difference in productivity may not be fully reflected in wages, which may be an unstated reason for strong employer support and oft-stated concerns about the adverse effect of reducing numbers of workers.[225] If it is the provisions of the RSE scheme itself, such as restrictions on employment choices for RSE workers, that is responsible for the reduction in market power of the workers compared to locals, then this would represent a regulatory subsidy. This may have negative consequences for local potential employees through contributing to a ceiling on wages. That is, at least up until the cap on RSE workers is reached, employers would prefer to hire RSE workers with low reservation wages compared with similar locals who have higher reservation wages.

Globally, consumer scrutiny of supply chains and the ethics of employment of low-skilled vulnerable workers is increasing. Price and quality alone may no longer be sufficient to secure market share: consumers want information about how the goods and services they are buying are produced as well.[226] In an age of social media, memes about poor practice, even if objectively unfounded, can spread rapidly. Growers in the horticulture sector using RSE workers are aware of these concerns and will need to continue to demonstrate their commitment to being good employers.

Where not enough RSE workers are available, as has occurred due to COVID-19, New Zealanders are responding to improvements in terms and conditions, and so far, the fruit is being picked. This again points to a reservation wage story: the RSE scheme appears to be putting a ceiling on terms and conditions for pickers which would normally be driven by local labour market conditions.[227]

5 The impact of seasonal, temporary migrant workers on the New Zealand economy

New Zealand grants significant numbers of visas with work rights to temporary visitors. The country leads the OECD in terms of the proportion of seasonal workers in the workforce.

Numerically, working holidaymakers and international students with work rights dominate. Due to COVID-19, discussions around RSE workers have been prominent in the media, even though they are a smaller percentage of the total.

Despite these large numbers, there has been limited empirical study of their effects on the local economy and workers. This applies internationally, as well as in New Zealand.

225 Possible adverse effects to a subset of the population that benefits from policies that overall create negative national impacts is, of course the perennial issue in economic reform. MBIE's Just Transition Unit is actively looking at this issue, principally in relation to the move towards a low-emissions economy (Ministry of Business, Innovation and Employment (2020a)).

226 In 2017, the New Zealand institute of Directors noted that the high use of seasonal workers in New Zealand created risks to firms. They also gave the example of 1,600 growers, pack houses and employment agents being audited on employment practices to satisfy German food industry requirements (Reid (2017, p. 23)).

227 Unfortunately, McLeod and Maré (2018) were unable to assess the impact of the RSE scheme on local workers in their econometric study due to technical limitations.

Short term visitors with work rights are likely to have different characteristics and motivations than other short-term migrants (such as essential workers) and permanent migrants:

- Working holidaymakers, international students and RSE workers may have lower reservation wages than locals for the same types of work.
- Working holidaymakers and students may have higher educational qualifications compared to the local workers with whom they are competing, which may be reflected in occupational downgrading for migrant workers.
- Working holidaymakers and students have significant flexibility in terms of employment choice (type of work, hours, location).
- RSE workers have limited employment choices in New Zealand, due to their visas being tied to employment by one or a small number of Recognised Employers.
- RSE workers are known to send substantial remittances to their home countries.

Taken together, these different characteristics suggest that local impacts from short term visitors with work rights may be different from those of permanent migrants. In particular:

- The wages that temporary migrants will accept may place a cap on the going rate for all workers in a sector, which may explain why local workers with access to better alternative options seem reluctant to be employed in the horticulture sector.
- Short-term visitors who are overqualified may have a competitive advantage when competing against locals for the same job.
- 'Gig economy' terms and conditions may be a better match to the (temporary, transient) lifestyle of short-term visitors.
- RSE workers may have limited market power and thus will accept terms and conditions that, while better than what they can receive at home, are below those normally required to attract permanent New Zealand residents into the horticulture sector.
- Employing RSE workers, rather than other migrant seasonal workers may dampen the flow-on effects to the rest of the local economy.

While the available econometric research suggests that increased temporary migration has led to modest positive local labour market impacts overall, results for sub-groups differ widely (some are positive, some are negative) and it has not been possible to identify results for some sub-groups, including RSE workers.

6 Conclusions

In keeping with our previous report for the Productivity Commission, we conclude that there is little good evidence from New Zealand that recent large increases in temporary workers are boosting long-term productivity at the firm level overall. Looking at the horticulture sector, its size has increased, but little is known about its overall productivity.

There is also some evidence that, along with the benefits it brings, temporary migration policy might be having some negative effects.

Given the mixed evidence, strong claims either way need to be treated with care. Many questions about the relative costs and benefits and dynamic impacts of temporary and seasonal migration on local workers and automation cannot be definitively answered based on the information currently available, and will require additional research. Such research would enable the question of the optimal mix between immigrant and temporary foreign workers to be addressed.

6.1 The RSE scheme

Regarding the RSE scheme, whether it continues to be a 'triple win' all round is open to question. This is why we recommended in *Could Do Better* that the scheme be reviewed, using an economic approach, to test these claims. Some bespoke data may be required.

The hypotheses that we propose such a study test is that the RSE scheme:

- **Is probably good for employers in the short term**. Highly productive RSE employees are more reliable and compliant than locals, and may be being paid less than they are worth.
- **Has some initial negative impacts on competing local workers**, given that many employers prefer RSE workers, and RSE wages put a ceiling on what employers are willing to pay. Over time, to what extent are these balanced by access to other jobs created as a result of the employment of RSE workers? How large are the social benefits from expanded career paths for local workers, particularly those who were previously disadvantaged?
- **Has influenced the nature, scale and rate of innovation and automation longer term**, thereby impacting potential productivity growth. Access to reliable seasonal labour has underpinned investment in year-round pack house facilities and encouraged investment in capital that is used alongside labour (such as mechanical platforms). Whether restricting numbers of workers would have affected the use of available technology (such as proto-type picking machines) or the incentives to undertake R&D into the possibility of substituting labour for technology generally is, at present, an open question. Exactly how developments in automation will influence the future demand for temporary and seasonal labour is also unknown.

6.2 Working holidaymakers and students

There is very limited evidence available to assess the impacts of the two largest groups of temporary visitors to New Zealand with work rights, namely, working holidaymakers and international students. A recent econometric study of these groups was unable to identify the impacts of increasing flows of working holidaymakers, possibly because the behaviour of people on working holiday visas is highly unpredictable. The available evidence suggests international students can lead to more local young people and beneficiaries being hired, while people on Study to Work visas have been found to negatively impact the hiring of local youth.

While further research using data sets like the IDI is possible, targeted surveys may also be required to improve understanding in these areas.

6.3 Could still do better

Migration can deliver positive results for both migrants and their new host community. What the right conditions might be for this to happen in the case of low-skilled, seasonal and temporary migrants cannot be assumed from the literature: rather, they have to be developed based on local context and kept under review as circumstances change.

Trade-offs are unavoidable, and objectives may conflict – for example, if RSE workers were paid wages that more closely reflect their productivity contribution, employers would be less well off.

Having a better information base upon which to conduct the inevitable discussions will not guarantee successful balancing of competing goals, but it is a necessary first step.

7 References

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