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LIFTING New Zealand's Productivity a research agenda

Sebastian Edwards (2013) wrote that when it comes to the economy New Zealand appears to exhibit 'Woody Allen syndrome'. In most of Allen's movies, he observed, the main character is leading what appears to be a charmed life ('interesting friends, a nice apartment, and a well-paying job') but he still worries a lot. New Zealanders too 'worry a lot. They worry about the economy and about the country's position in the world.' And, as Edwards went on to note, as 'Woody's movies progress, the viewers realise that, although he is sweet and loveable, he has certain traits that could be

improved on. ... Similarly, and in spite of New Zealand's wonderful showing in ranking after ranking, there are a number of areas where reforms would make the country's position in the world even better.'

So it is with New Zealand's productivity, which is a measure of the economy's ability to turn resources into goods and services. The latest figures suggest we are doing well. Over the last couple of years measured sector output, labour productivity and multi-factor productivity have all been growing. And not only is labour productivity growth picking up, but labour inputs are slowly increasing too. Yet, when considered in a wider context, the picture is not quite as

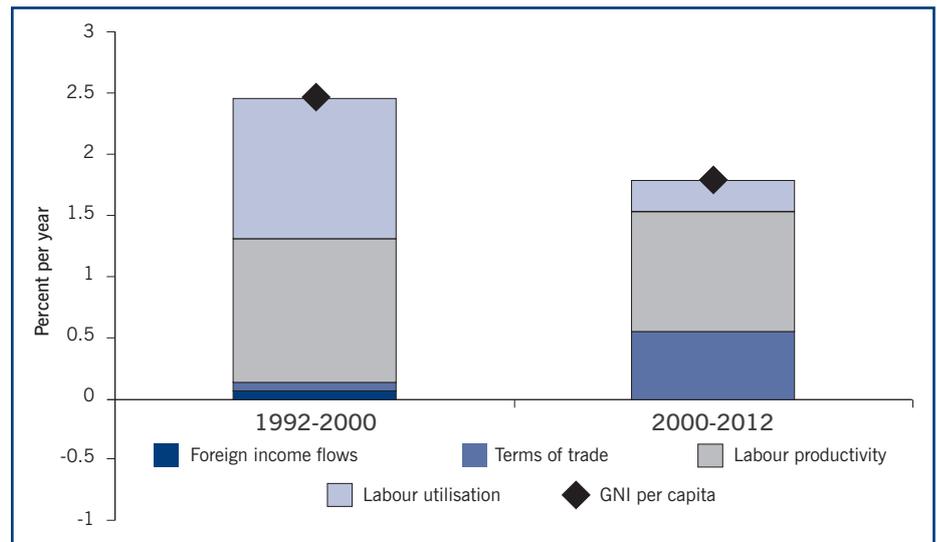
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rosy. Labour productivity growth since the global financial crisis, and indeed throughout the 2000s, has been below that of the 1990s. New Zealand is still below the OECD average for output per capita and labour productivity. And there is a question of how much of the ‘rock star’ growth expected in the next year or so will be due to terms of trade increases and the Christchurch rebuild. These factors will only take the economy so far. We need to continue to lift our productivity.

The community of researchers working to address these productivity-related issues in New Zealand, however, is small and spread across a number of organisations. There are gains to be made from coordinating research efforts. With this in mind, a Productivity Hub has been established as part of the Government Economic Network. In July 2013 the Productivity Hub held a symposium to discuss New Zealand’s relatively poor productivity growth compared to other OECD countries, and opportunities to turn this around. Following on from this symposium, the Productivity Hub’s governance board set out to develop a Forward Looking Agenda of Research (FLARE). The goal is to produce an agenda to aid in the coordination and collaboration of research work on understanding and improving New Zealand’s productivity performance. This article outlines the findings of the FLARE process so far.¹

This interest in productivity is not new. Indeed, it is more than 50 years since Conrad Blyth began his work measuring productivity at the New Zealand Institute of Economic Research (Blyth, 1961). Given this, the approach taken to developing FLARE was not to develop a definitive review of the literature, but to highlight major findings, information gaps and relevant questions. A proposed agenda for addressing these questions was also developed. The objective is to move beyond simply identifying problems to, in turn, more closely identifying which policy changes would be most effective in lifting New Zealand’s productivity and the trade-offs involved in them. It is likely that there will be debate over the findings and questions. It is also likely that the

Figure 1: Sources of income growth in New Zealand



Source: Conway and Meehan, 2013, p.9

research agenda will evolve as progress is made and new knowledge generated. This is perfectly natural for a topic as complex and important as productivity. This is why the Productivity Hub’s governance board felt that it was important to publish this article summarising their assessment. This is not a final word, but hopefully the start of many more conversations on lifting productivity.

What do we know about productivity?

The first step in developing FLARE was to pull together what we already know about New Zealand’s productivity experience and organise the major findings into ‘buckets’: in particular, productivity performance, resources (e.g. natural and intangible assets, people and capital) and intermediate outcomes (e.g. innovation, international connections and macro settings).

Productivity performance

In the long run productivity is probably the single most important factor in determining a country’s wealth and well-being (Krugman, 1994). Take New Zealand since the early 1990s. As shown in Figure 1, increases in labour productivity have made a bigger contribution to lifting gross national income (GNI) than any other thing, accounting for over half of all GNI growth. Yet this contribution must be seen against a backdrop of slowing income growth over the 2000s. This largely reflected a slow-down in the growth

in labour utilisation, as the recovery from high unemployment and labour participation moved towards natural limits. But growth in labour productivity slowed also (Conway and Meehan, 2013).

To some degree the effect of this slowing growth in labour utilisation and productivity was offset by changes in New Zealand’s terms of trade (the ratio of export prices to import prices). As the governor of the Reserve Bank noted last year, New Zealand’s terms of trade were around 20% higher than the average for the 1990s (Wheeler, 2013). This improvement, along with a rebound following the Canterbury earthquakes and the global financial crisis, goes some way to explaining the current period of high growth. Yet this will only take the economy so far, and consideration must be given to the long-run drivers of economic performance.

The importance of lifting productivity becomes clearer when focus shifts from the past to the future. Like many other countries, New Zealand faces future challenges, including demographic change, environmental pressures, and constraints and changes in the distribution of income and wealth (Upton, 2013). In relation to the first, as Statistics New Zealand’s (2011) median population projections show, between 2016 and 2061 the number of people over the age of 65 is projected to increase by 142% to 1,905,000 (from 788,000). The increase in people over 65 makes up 79.3% of total

projected population growth over these years, and the median age will increase from 37.3 to 44 years, which will be reflected in higher dependency ratios. Important changes in the composition of the population will also take place, with the Māori and Pacific populations, in particular, gaining population share (Boston, Callister and Wolf, 2006).

The fiscal effects of these demographic changes, such as on New Zealand Superannuation and health expenditure, have been widely canvassed (Treasury, 2013). What has been less widely canvassed is the economic effect of these demographic changes, including on productivity. Guest (2013) showed that population ageing affects productivity through the dependency ratio (ratio of

relatively efficient at utilising this resource base (indicated by a relatively low natural resource depletion as a share of GNI (World Bank, 2013)), there is concern over the management of some resources (such as water), and how natural resources are accounted for in the national accounts and productivity statistics. These resources are not only valuable in themselves, but play a key role in shaping New Zealand's intangible assets (e.g. New Zealand's 'clean and green' reputation). A gap in the knowledge of the full contribution of environmental assets creates a risk that they will be undervalued (Clough, Hickman and Stevenson, 2013; Kerr, Coleman and Pemberton, 2013; Green Growth Advisory Group, 2011). There are also gaps in our understanding about

to people management practices (Green et al., 2011). There has also been debate over labour market regulations, which affect the availability, flexibility and cost of labour (Frances, 2004). It has also been noted that gains could be made through better matching of skills and employers' needs, improved links between employers and the education and training systems, and workplace training (Timmins et al., 2012; Barnes and Dixon, 2010). Migration, or making New Zealand 'a place where talent wants to live', to use Paul Callaghan's phrase, could also play a role through increasing labour market density (McGuinness, 2013). And, finally, while the school system does relatively well, this does not mean that there is no scope for improvement, particularly given the tail of underperformance.

To a large degree the economy's capacity to utilise natural resources and people depends on capital. Hall and Scobie (2005) argue that, in comparison with Australia, New Zealand has had a low ratio of labour-to-capital prices, meaning that it has been relatively cheaper for businesses to hire more workers than to invest in physical capital. This high cost of capital relative to labour has been seen as a product of low national savings (although there is debate over this) and a shallow financial sector, which, in turn, lowers capital intensity and negatively affects productivity (Dupuy and Beard, 2008; Cameron et al., 2007; Mason and Osborne, 2007; Mazur and Alexander, 2001). But the cost of capital is not the only challenge. The capacity of firms to make the most of capital spending is important too. Information technology (ICT) is a good example. This has been shown to make a strong contribution to labour productivity growth (Statistics New Zealand, 2013), yet the advantages of spending on new technology will only be fully realised when firms move beyond simply 'computerising' or 'web-enabling' existing processes. This is especially important in New Zealand, as, although our investment in ICT as a share of GDP is about average compared to a selection of other OECD countries, the small size of the economy means that a relatively higher proportion of GDP needs to be dedicated to this to achieve equivalent ICT capability (as many ICT

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elderly dependents to workers), the second demographic dividend (potential increase in savings as working lives increase) and age complementarities (different skills) of workers. This, he goes on to show, could have an aggregate negative impact on living standards of somewhere between zero and 15% over the next 40 years. The width of this range highlights not only the inherent uncertainty of projections of the national economic impact of ageing, but also the value of getting the policy response right. An environment where workplaces successfully utilise the complementary skills of both younger and older workers is, for instance, more likely to face a loss in living standards closer to the zero end of the range rather than the 15% end.

Resources

New Zealand's abundant natural resources are an important factor in production (Upton, 2013). Yet, although we are

which industries are more or less eco-efficient, and how structural economic change has influenced national-level eco-efficiency measures. More generally, it has been argued that New Zealand needs to build more products around our existing biological base (with a stronger focus on intellectual property) (Maré, 2013; Smith, 2006).

People are an important resource too. New Zealand generally does relatively well in utilising the labour available (as indicated by labour participation rates). Further, while the quality of labour is only partly captured in schooling, this metric indicates that New Zealand produces good-quality labour by international standards. Yet this is not reflected in returns to education, as, despite having long working hours, New Zealand's per capita GDP is low. This raises a number of issues. One is the weak nature of managerial capital in New Zealand, particularly when it comes

costs reflect a world price) (Productivity Commission, 2014).

Intermediate outcomes

New Zealand's economic geography means that it requires a set of structural policies that are attractive and welcoming enough to overcome distance and size and attract the drivers of prosperity – investment, skills and ideas (Guillemette, 2009). There is a reasonably broad consensus on this, but less well understood is how specific interventions and approaches could help address these challenges. Further, as good as New Zealand's reforms to the business environment have been in the past, the world is not standing still. Approaches that were once world-first are now more common; there are signs that industry concentration has increased; and regulatory risks and costs have risen in key areas. While New Zealand remains an entrepreneurial country – in the sense that it is relatively easy to start a firm – innovation and international engagement are persistent concerns.

Innovation is important, as not only can it push out the technological frontier, it can help move laggard firms up to it. There is a popular view that New Zealanders are characterised by 'ingenuity and innovation'. However, the economy-wide evidence for this claim is mixed. Crawford et al. (2007) argue that New Zealand's performance in patents and private research and development (R&D) share is on a par with (or even above) what would be predicted given our distance from major R&D-performing countries, population, average firm size and industry composition. However, while the OECD (2013) ranks New Zealand sixth in terms of academic publishing rates (publications in the top-quartile journals per GDP), we are only 19th in terms of patenting rates (based on triadic patent families: a set of patents in different countries that protect the same invention). On per capita expenditure on R&D by business we rank 31st.

Further, without outperforming other countries in the upstream generation of innovation (such as patents and private R&D), New Zealand cannot expect to match other countries in commercialising and capturing value from innovation.

Innovation requires knowledge absorption and knowledge application (Lewis, 2008). Not only does the technological frontier need to be pushed out, but firms need to make the most of these opportunities through developing new ways of working. However, the low level of business R&D implies not only limited knowledge creation but also an inability to absorb innovation from elsewhere. Further, as Knuckley and Johnston (2002) showed, the R&D efforts that are undertaken tend to be by a small group of 'leader firms' (which they defined

Nonetheless, as important as international connections are (and they are important), maximum gains come when these connections are supported by strong domestic productivity performance.

By the end of the 1990s New Zealand was considered a world leader in implementing product-market regulation that was supportive of competition in areas where it was viable. Since then, the intensity of reform has fallen and New Zealand has lost some of its policy advantage (Conway, 2011). This may be especially problematic given the 'low

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as the top 20% in terms of practices and outcomes). The size of the New Zealand economy may make leveraging off public R&D efforts particularly important (Crawford et al., 2007).

There is an important distinction between an economy being open (an absence of formal barriers to flows taking place) and being connected (high actual flows). New Zealand is relatively open but only moderately well connected (Skilling, 2012). The flows of people and inward investment are relatively high; but imports, exports and outward direct investment are low. New Zealand firms' exports are not well integrated into global value chains, and they have difficulty assessing and absorbing technological developments. Foreign direct investment and outward direct investment could provide important mechanisms for building these international connections (Wilkinson, 2013). Regulatory coordination, particularly between New Zealand and Australia, can play an important role too (Productivity Commission, 2012; Guerin, 2005; Goddard, 2002).

density' nature of the New Zealand economy and where New Zealand sits relative to the world technological frontier. But the optimal stance of regulation requires careful thought. Take competition policy. It could be that strengthening competition will reallocate resources to more productive firms and thereby increase overall productivity. However, an alternative view is that larger firms and/or firms cooperating with one another may be more likely to achieve innovation, which is also an important driver of productivity.

There is also a question of whether the balance of the economy is right – particularly the role of consumer spending and investment in housing assets – given the relative capital shallowness of the New Zealand economy. As Helm (2012) argued in the United Kingdom, irrespective of whether it is funded domestically or from overseas, investing in infrastructure requires an economy 'to create the space to pay the bills, to provide the savings, to go into the investment'. In short, it is necessary to consider

sacrificing some current consumption to invest in the long-term drivers of growth. Further, while New Zealand has declining productivity relative to other countries, it also has an exchange rate that could be argued to be persistently overvalued. This high exchange rate may reflect traditional economic drivers, such as the terms of trade, relative cyclical economic performance and inflation outcomes (McDermott, 2013); but it also may, at times, have partly reflected the interaction of monetary and fiscal policy (with expansionary fiscal policy potentially meaning that monetary policy

- added value (additionality): addressing a clear gap in understanding and not duplicating work elsewhere;
- contribution to capacity building: the potential to be a catalyst for other work (opening avenues for further research) and to contribute to staff development;
- feasibility: attainable objectives, realistic scale, timescale, scheduling and resource costs; and
- scholarly importance: contribution to theory and methodological development.

- How does productivity vary across firms and sectors?
- Which firms and sectors have the highest productivity growth (i.e., who are the star performers)?
- What characteristics (age, size, capital intensity, ownership, use of migrant labour, R&D, etc.) do they share (or differences do they have) relative to low-productivity growth firms and sectors?

Although these are largely descriptive questions, they are nonetheless important, as clearly identifying what you are dealing with is a useful starting point for analysis. Further, this descriptive analysis will provide a basis for an improved understanding of how changes take place at the level of the firm. As Sautet (2000) noted, many currently accepted theories of the firm cannot provide insights into important market phenomena such as entrepreneurship. The conceptual insights generated will then, in turn, lead to further empirical questions, some of which may be suited to the LBD, and some of which may require other approaches (such as case studies). This iterative process of data analysis and theory-building will help researchers move beyond simply identifying problems to more closely identifying which policy changes could be most effective in lifting New Zealand's productivity.

The remaining questions can be grouped into four key themes. The first relates to the efficiency of resource allocation in New Zealand. As Restuccia (2014) and Bertelsman and Doms (2000) have shown, the systematic reallocation of employment and hours can explain many countries' experiences of productivity catch-up, slow-down or stagnation. It appears also worth considering this in the New Zealand context, as the firm-level distribution of productivity appears to be wide and so the potential benefits of improved resource allocation could be significant. There are also important regional economic questions, with there being a sizeable productivity premium in Auckland, around half of which can be attributed to industry composition (Maré, 2008). It would thus be useful to know what factors influence the speed with which low-productivity firms can

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had to be tighter than otherwise) (Brook, 2012).

A Forward Looking Agenda for Research

The objective of FLARE is to provide a list of relevant research projects which would advance understanding of New Zealand's productivity issues and ultimately improve policy. A short-list of proposed projects for the next two years is shown in Figure 2. A short-list has been chosen because, although lifting productivity requires action across a range of fronts, longer lists fail to illustrate priorities and can distract from difficult questions. Further, as is common in research, this agenda will evolve as progress is made and new knowledge generated (or as the military adage goes, 'no plan survives contact with the enemy'). The projects on this short-list have been prioritised based on judgements about their:

- impact on policy outcomes: relevance to key government priorities and direct potential to influence policy and/or practice;

The projects will make use of a partnership with Motu Economic and Public Policy Research to exploit Statistics New Zealand's Longitudinal Business Database (LBD). The LBD is a rich resource for understanding New Zealand firms and can provide a uniquely detailed view of their behaviour and performance across a broad range of topics (Fabling, 2009). The aim is to not only produce new research reports but, more generally, to build broader practitioner capability with these data: a primary objective is to ensure that more people can work with these data and, as a result, expand the set of research projects undertaken with them. This approach should also help to contribute to efforts to improve measures of productivity and understanding of their limits, including the differences between firm-based and economy-wide (macro) measures.

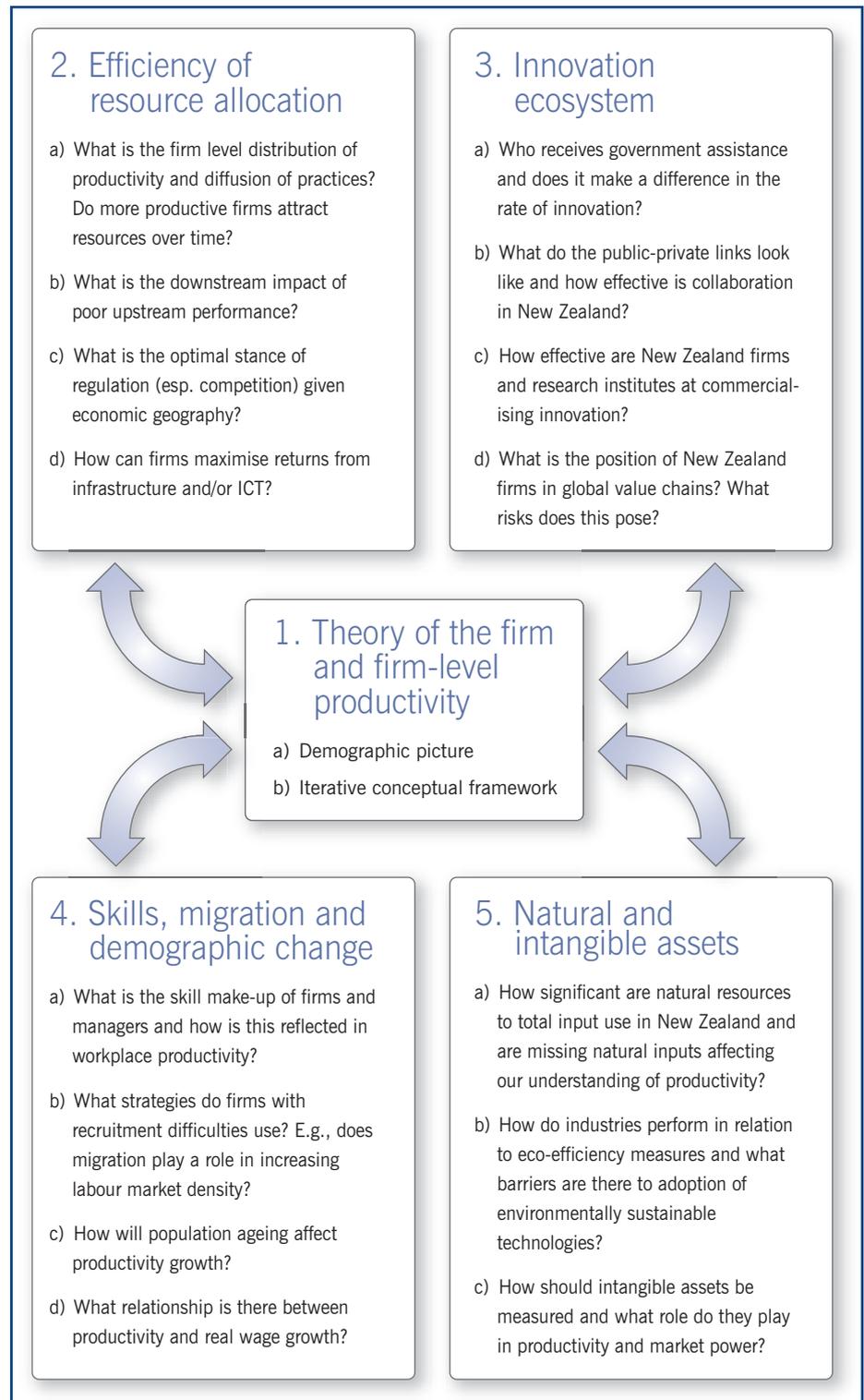
One early output will be more detailed data on the demographic characteristics of firms in New Zealand. Key questions include:

catch up to high-productivity firms. This, in turn, highlights the importance of how innovation, technology and management practices are diffused across firms, and the potential roles that small markets, limited international connections and competition (or collaboration) could play. Reallocation can also raise important political economy issues (Grennes, 2003).

The second theme relates to the innovation ecosystem. This is a topic of perennial concern but also substantial government activity over many years. We need to better understand not only who receives government assistance, but what difference this makes to the rate of innovation and productivity growth. The case for any intervention needs to be made, and, as the OECD has noted (Warwick, 2013), more monitoring and evaluation of industrial policy initiatives is likely to be valuable. The right mechanisms for and approaches to support (for example, direct grants versus tax relief, or targeted versus horizontal approaches) must be chosen.² There is also growing interest in how New Zealand researchers and organisations (including business, iwi and other community groups) collaborate with each other. A better understanding of these science-to-business links, along with the role that the public sector does and should play in these, would be valuable (Māori Economic Development Panel, 2012). There would also be value in understanding how effective New Zealand firms and research institutes are in bringing innovations to market (both domestic and international) and capturing the value from innovations, as well as whether the market rewards more innovative firms with more resources (and, ultimately, whether such firms are more likely to survive).

The third theme brings together important questions regarding skills, migration and demographic change. Like many other countries, New Zealand has to adjust to demographic change. Not only is the population getting older, but the ethnic composition of the population is changing too. As a result, it will be more important for firms to utilise the skills of all population groups (people of different ages, for example).

Figure 2: Proposed priority projects for the next two years



Source: Productivity Hub

This shows the importance of the ‘race between education and technology’ and of educational infrastructure evolving so that the supply of skills more closely matches changes in demand (Goldin and Katz, 2008). It also shows the importance of improving management practices. Further, while migration already plays a key role in the New Zealand labour

market, this could (along with capital deepening) help offset a shrinking labour force: the strategies that firms use in this area are crucial. It would also be useful to better understand the relationship between productivity growth and real wage growth, including the effect this may have on different population groups.

The fourth theme highlights the importance of natural and intangible assets. While New Zealand has abundant natural resources, continuing to manage these effectively will be essential. These assets are not only valuable as traditional factors in production, but play a key role in shaping New Zealand's intangible assets (such as the benefit from New Zealand's 'clean and green' reputation). Intangible assets (brands, patents, franchises, software, research programmes, ideas and expertise) have become an increasingly important factor in production, but are not measured or understood particularly well in New Zealand. While these questions raise significant measurement challenges, this does not mean that robust measurement should not be attempted. As the Australian Productivity Commission has noted, valuing 'environmental outcomes in these types of situations, while difficult and sometimes contentious, may assist with making trade-offs in a more considered way' (Baker and Ruting, 2014, p.11).

Conclusion

There is a line attributed to Ernest Rutherford which goes: 'we've got no money, so we've got to think'

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(Andrade, 1964). This gets to the heart of New Zealand's economic challenge. Productivity is important everywhere, but even more so for a small and remote country like New Zealand. And this is a challenge for economic research too. Many of the conventional drivers (e.g. physical capital investment; years of schooling) do not adequately explain our productivity performance. Further, not only does the question appear more complex here, but the domestic capacity to undertake research is small and spread across a number of organisations. This article has thus outlined efforts by the Productivity Hub to develop a shared agenda for research on understanding and improving New Zealand's productivity, particularly at the level of the firm. The objective is to move beyond simply identifying problems and to, in turn, more closely identify which policy changes would be most effective in lifting New Zealand's productivity.

1 Readers are welcome to direct questions or comments on the FLARE process or on this article to the author at patrick.nolan@productivity.govt.nz or on 64 4 903 5172.

2 When it comes to government support for business, the OECD has distinguished between 'targeted' and 'horizontal' approaches (foundational policies) (Warwick, 2013). Targeted approaches are restricted to particular firms or sectors, while horizontal approaches apply more generally and can include improving the regulatory environment and the performance of regulatory institutions. On targeted policies, there is a question of whether firm size or age should be seen as the main driver of innovation and growth.

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