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New Zealand Productivity Commission
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Taylor Fry submission to the inquiry into immigration, productivity and wellbeing

We thank you for the opportunity to make a submission to this inquiry. We believe that immigration policy settings and strategy are a key lever in influencing the long-term economic growth and the wellbeing of New Zealanders. Understanding where skills shortages exist is a key part of this.

Our submission focusses on the identification of skills shortages and specifically question 18 of your Issues paper – *Immigration, productivity and wellbeing*

What is the best way to identify workforce or skills shortages?

1 About Taylor Fry

Taylor Fry is an actuarial and analytics consultancy with offices in Wellington, Sydney and Melbourne. We were established in 1999 to provide straightforward general insurance actuarial advice to insurers and the public sector. We now also offer sophisticated analytics and modelling services to a diverse range of public and private sector clients. Qantas Loyalty owns a 51% stake in Taylor Fry, with Taylor Fry staff and their associates owning 49%.

2 Estimating skills shortages

Taylor Fry recently completed a project with the Australian National Skills Commission (NSC) to model skills shortages in Australia. The modelling informed the development of the Australian Skills Priority List (SPL). We think the modelling approach developed for this project is useful when thinking about how to identify skills shortages in New Zealand and is potentially replicable to some degree using New Zealand data.

The inaugural SPL was launched on 29 June 2021¹, with the latest methodology published online². The model we developed, the SPL Indicator Model, is a key part of the overall SPL methodology.

2.1 Why model skills shortages?

There are over 1,000 occupations classified using the Australia New Zealand Standard of Classifying Occupations (ANSCO). Sufficiently complete and timely data to assess the existence of skills shortages across all occupations does not exist in Australia or New Zealand. Therefore, we cannot access a single data source to explicitly identifies where skills shortages exist across all occupations.

Modelling can be used to bridge the gap between the data we have and what we explicitly what we want to know i.e. skills shortages across all occupations. Modelling enables us to extrapolate the information contained in available data to areas where data doesn't exist.

2.2 Approaches to modelling skills shortages

Table 2.1 summaries different methodologies to modelling skills shortages.

Table 2.1 – Broad classes of approaches used to model skills shortages

Approach	Description	Strength	Shortcoming
Labour supply and demand model	Compares projections of people entering and leaving an occupation	Provides extra insight on the trends for each occupation	Data is rarely available and results tend to be sensitive to small changes in inputs
Qualitative review of indicators	Form a view for an occupation by considering a range of labour market indicators	Recognises expert judgement	Subjectivity and potential inconsistency
Indicator model using subjective weights	A set of labour market indicators are combined into a single score in a subjective way	Provides a method to consistently score each occupation	Unable to validate if the way indicators are combined is optimal
Predictive model built against some objective measure of truth	Define 'skills shortage', measure and then figure out what indicators are the best proxies	Clear form of validation of measures	Chosen measure becomes 'truth' when full picture may be more nuanced.

The modelling we performed for the NSC used the last approach. The steps taken were as follows:

- **Define 'skills shortage'** – The Australian Department of Education, Skills and Employment run the annual Survey of Employers who have Recently Advertised (SERA). The survey collects information about employer' experiences recruiting skilled workers. We used vacancy fill rates from the SERA as our defined measure of 'skills shortage'.
- **Developed a National-level indicator model** – About 200 labour market indicators were constructed for testing, covering vacancies, unemployment, wages, migration, education and demographic information. This list was reduced to 11 indicators for our final model of vacancy fill rates.

¹ <https://www.nationalskillscommission.gov.au/news/news-centre/inaugural-skills-priority-list-launched>

² <https://www.nationalskillscommission.gov.au/skills-priority-list-methodology>

- **Extension to State and Regional levels** – An integrated approach allowed estimation at National, State and Regional levels. Results were blended with SERA findings where possible.

The resulting SPL Indicator Model produces an estimate (or ‘nowcast’) of vacancy fill rates across the majority of ANZSCO occupations.

Specific details of the modelling approach, including the indicators and parameters used can be found in the previously referenced SPL methodology link.

2.3 Observations on the estimation of skills shortages in New Zealand

The observations in this section reflect our current thinking on the area.

Defining skills shortage

Internationally, there is no single uniform definition of shortage. This is different to other economic statistics, such as the unemployment rate, which are largely standardised and routine. However, an **employer-focused definition** of shortage seems most appropriate. If employers cannot find people with the right skills or the right occupational background, it is generally reasonable to equate this to a shortage.

The Australian SERA survey has the advantage of directly targeting whether positions for specific occupations could be filled. This makes it a well-targeted tool for identifying shortages in an objective way. Even so, there are subtleties:

- It is far easier to identify ‘occupational shortage’ rather than ‘skills shortage’. While there is some research done on trying to identify the skills underlying an occupation and measure emerging needs for skills, most job advertisements and administrative statistics remain at an occupation level. We expect a focus on occupational shortages remains most practical in the short term.
- Some occupations may have low fill rates for different reasons. For instance, sub-occupations (e.g. experience in certain types of programming languages for a computer programmer) can differ enough that there may be skills mismatch within occupations; such a mismatch might have a different solution (e.g. reskilling) to the situation when there is a genuine shortage in the occupation (e.g. increased targeted immigration). Other occupations may be in shortage due to a need for certain levels of experience, rather than newly trained people.
- Hiring practices also differ across occupations. Industries that rely less on standard hiring channels (such as online ads) will be harder to measure – a low fill rate may be ‘latent’ in the sector.
- While ‘gig’ and self-employed work still represents a small fraction of overall economic activity, it may be increasingly important in certain sectors.

Developing an understanding of these nuances over time improves the ability to identify shortages.

Focus on medium to high skill levels

There are various measures of skill level associated with occupations. For example, ANZSCO includes a skill rating of its occupations. Often this is tied to the typical level of training or study required for entry to an occupation.

Lower skill jobs that have low training barriers to entry, will have different dynamics to higher-skill jobs. Shortage is more likely to be the result of aggregate labour supply issues, wages and general economic conditions. In contrast, specific shortages for higher-skill jobs can come about due to issues with training pipelines and the presence of appropriate skilled migration. These specific imbalances are more likely to benefit from targeted skills policies.

We also note that the level of training and skill evolves with time; for example, there is a trend to extended training across care professions such as social care and childcare that make them more suitable for skills shortage monitoring.

Current shortages are indicative of future shortages

Models that attempt to pick future shortages can be useful. For instance, if a particular workforce has an overly large fraction of the occupation nearing retirement, a future shortage can be anticipated.

However, the SERA shows that shortages tend to be persistent over time. This means that current shortages are likely to continue and so responding them is appropriate, even if there is a lag time. Furthermore, 'nowcasting' shortages, while difficult, is still significantly more tractable than medium-term forecasting of shortages.

The value of existing secondary data sources

Our work for the NSC demonstrated that roughly half of the variation in the occupation-specific employer fill rate could be explained by labour market factors. This means that even in the absence of specific measures, evidence of a shortage (or lack thereof) can still be assembled, with the Australian model representing something that can be replicated in New Zealand.

For instance, the combined presence of high numbers of job vacancies, rising wages and short unemployment durations in an occupation all point to a shortage and so represents useful evidence. Our work suggests that such measures will validate well against more direct measures of shortage.

One advantage of such an approach is that it makes good use of existing data. Further, this data can be applied across a range of regions and occupations relatively easily.

The value of consultation

Our view is that no single model for identifying skills shortages will deliver optimal results. Rather, blended approaches that are informed by multiple information sources are likely to give the most complete picture. Deciding which occupations to put on New Zealand's skills shortage lists will remain a subjective decision. However, the more informed and evidence-based this decision is, the more likely it is that the lists will reflect actual shortages and hence best serve their purpose.

At present, we understand that the occupations listed in New Zealand's skills shortage lists (Long-term skills shortage list, Regional skills shortage list, Constructure and infrastructure skills shortage list) are largely informed by consultation with affected industries, employers, unions and other interested parties.

A consultation led approach has merit. People operating within industries have first-hand views that can't be easily replicated with data. However, it also has some shortcomings including:

- Converting qualitative judgements on shortages into a quantified view of 'how many and where' is often difficult.
- Comparing between industries/occupations can be difficult given relative differences in lobbying power and scale. Given any industry or employer has a vested interest in ensuring an appropriate pool of available skilled labour, relative skills shortages may not be well represented.
- Deciding which occupations to remove from the lists is potentially challenging. Industries, employers and unions are far more likely to engage in the context of an occupation being added to the lists rather than an occupation being removed.

While consultation is likely to remain a key information source going forward, we believe having this as a component to the research, combined with other ideas outlined above, represents a more comprehensive picture of skills shortages.

Broader considerations

Addressing skills shortage via targeted immigration produces benefits for employers (who can find the staff needed to grow a business) and consumers. The implication for the existing labour force is less clear:

- High levels of skilled migration may reduce general wage pressure, as well as specific wage growth in high-demand sectors. In a decade of low wage growth, it is reasonable to consider how migration policy may be impacting inflationary pressures.

- There is a perception that skill migrants take ‘high earning jobs’, whereas in some cases this could be supported by proactive training. When a skills shortage is identified, the balance between training and migration options is important.

We note that quick changing events like the COVID-19 pandemic (and associated travel restrictions) can heavily affect skills models; in Australia, there has been a rapid shift from high underutilisation to widespread labour shortage. Any approach to estimating skills shortages that relies on modelling needs to be cognisant of this and adapt with conditions accordingly.

3 Conclusion

We believe that a data-led approach can help New Zealand improve its understanding of skills shortages. The work we performed with NSC provides a blueprint as to how such an approach can work. Feasibility work would be required to test whether the methodology used (or variations thereof) could be applied in New Zealand using available data. However, even if it were not feasible, most of the Australian findings around secondary labour market sources are likely to be transferrable (both the indicators and the magnitude of effect), allowing improvements even without a specific New Zealand definition of ‘skills shortage’.

We thank you again for the opportunity to make a submission to this inquiry. We are happy to help further in the future.

Yours faithfully



Hugh Miller
Principal



Dan Stoner
Director