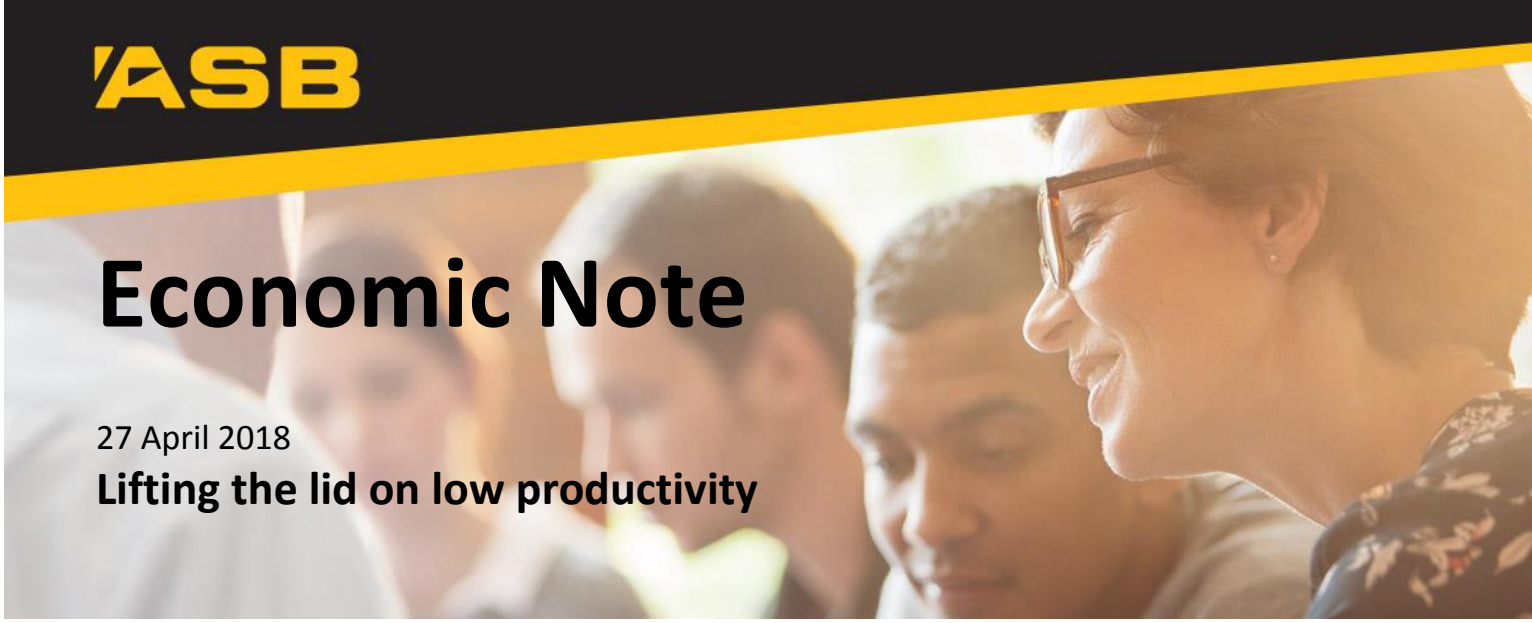

Economic Note

27 April 2018

Lifting the lid on low productivity

Summary and implications

What is productivity and why is it important?

There are two major ways to lift overall GDP. Either more capital or labour can be committed, or we can work smarter, by combining them more efficiently. Resources are finite so the latter route (i.e. higher productivity) is the key to boosting per-capita incomes and overall living standards.

How has NZ fared and what might this be linked to?

New Zealand has traditionally been a weak performer in the productivity stakes, with GDP per hours worked (labour productivity) averaging just over 1% per annum since the early 1990s.

New Zealand's GDP per-capita is around 20% below the OECD average, with a larger shortfall relative to Australia and the US. Despite having an open trade and investment regime and our solid economic performance of late, there are few signs that the NZ economy is catching up with higher productivity countries. Our small size and distance from key markets could be impediments.

The productivity performance for sectors from which productivity can be more accurately measured has been somewhat better than for overall GDP, with labour productivity averaging 1.9% since the early 1990s**. However, there has been a notable slowing in labour productivity growth since the global financial crisis (GFC). With the odd exception, the slowdown has been reasonably generalised across most industries.** It mostly reflects a slowing in capital accumulation, particularly in relation to strongly growing labour inputs. Output after adjusting for inputs (total factor productivity) has remained close to historical averages for most sectors.

Implications for NZ economy

There are cyclical aspects which suggest that the current lull in labour productivity is likely to be fleeting. Our expectation of slowing growth in labour inputs and the foreshadowed strengthening in business investment should see output per hours worked strengthen over the next year or so. This is what our forecasts suggest.

However, **our analysis tentatively suggests that the trend growth in labour productivity over the next few years may be somewhat weaker than historical averages**, particularly if employment growth remains low in traditionally high productivity growth industries

Our analysis using industry data also tentatively suggests that relationships between productivity, output, and investment accumulation may have changed post the GFC. **For the RBNZ this may mean focusing more directly on pricing dynamics and the factors impacting on inflation rather than relying on capacity metrics.**

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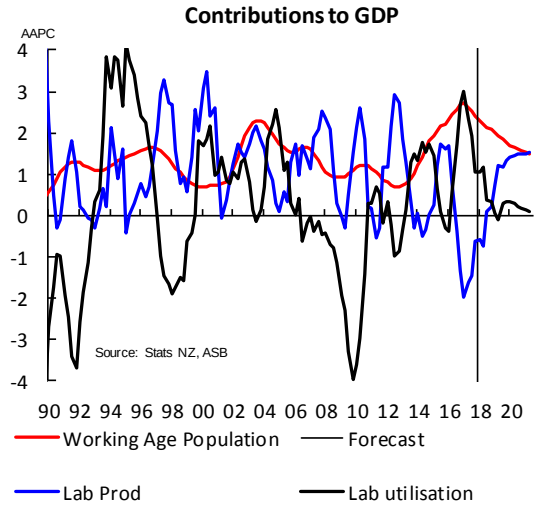
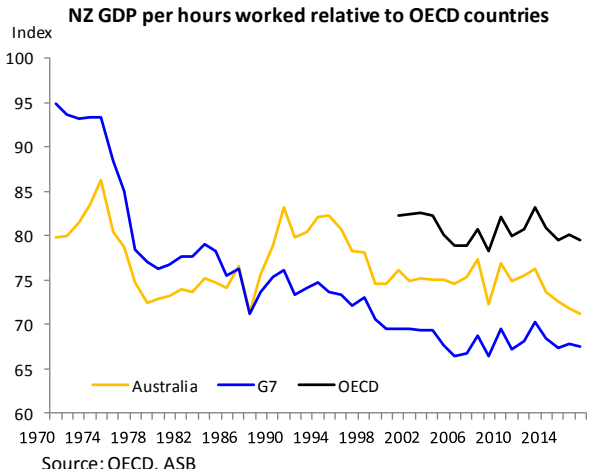
What has been happening?

The New Zealand economy is currently in a sweet spot of solid growth and low inflation. One of the risks facing the economy is that capacity constraints could act to slow the pace of domestic expansion. On a number of conventional measures, the labour market is currently very tight with the unemployment rate at a nine-year low and with labour force participation, the employment rate and surveyed measures of labour shortages at elevated levels. This has occurred despite an ageing population, which would typically tend to result in lower attachment to the labour market. We will discuss why this time is likely to be different and what it could mean for inflationary pressure in a forthcoming note.



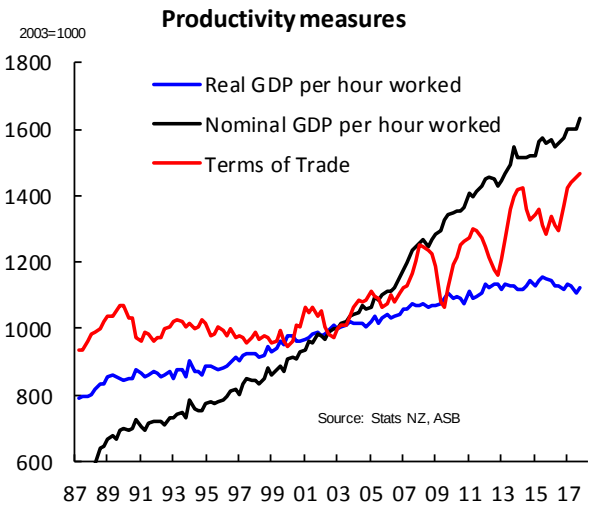
GDP growth has averaged roughly 3% since the early 1990s. More than half of this growth is due to increased inputs of labour, with the growth in hours worked averaging roughly 2% per annum. Linked to the latter has been strong growth in the working age population (average of approximately 1½% per annum) and increasing labour utilisation. Of late, the stronger growth in hours worked has depressed aggregate labour productivity, which is around 3% below mid-2015 levels. Annual GDP growth is expected to roughly average 3% over the next couple of years, with the slowing in labour inputs offset by a cyclical strengthening in labour productivity growth.



How has New Zealand fared globally?

Our productivity track record has been poor. Labour productivity (defined as output per hour worked) growth has averaged slightly more than 1% per annum since the early 1990s, well below OECD norms of around 2% per annum.

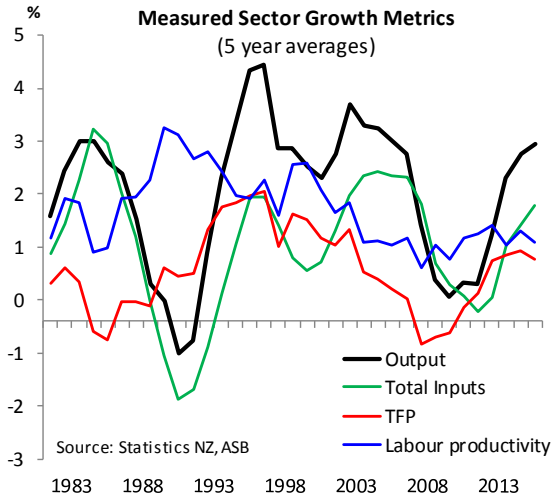
Low labour productivity is nothing new to New Zealand. The seeds were sown in the 1950's and 1960's with New Zealand losing considerable ground relative to OECD peers in the 1970s and early 1980s in terms of labour productivity and in GDP per capita. Despite the solid performance of the NZ economy of late, output per hours worked has remained becalmed at around 20% below the OECD average. Our real GDP per hours worked is about 40% below that of the US and is close to 30% below that of Australia. Despite having an open trade and investment regime and our solid economic performance of late, there are few signs that the NZ economy is catching up with higher productivity countries. Our small size and distance from key markets could be impediments.



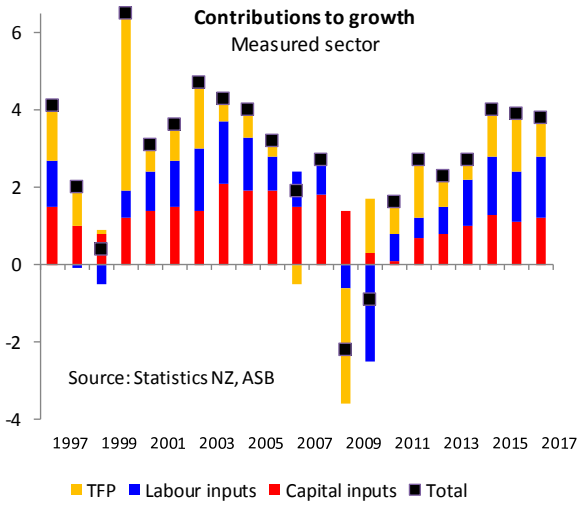
At present, this lacklustre labour productivity performance has been masked by strong population growth and the rising Terms of Trade, which has boosted economy-wide purchasing power and nominal GDP. **With the goods Terms of Trade already the highest since 1950 and with the peak in net permanent and long-term immigration looking to be behind us, there are limits to how much more can be gained from these influences in the current cycle**. Achieving more growth in the next few years will need to come from strengthening labour productivity.

A more detailed look at NZ

More detailed productivity statistics for New Zealand are available for the "measured sector", which constitutes roughly 80% of GDP. It mainly contains enterprises within 18 industries that are market producers and typically includes excludes industries in which outputs are not adequately measured independently of inputs, with some series available back to the late 1970's[1]. **The productivity performance for this group is somewhat better than for overall GDP, with labour productivity averaging 1.9% since the early 1990s. What is also apparent is that labour productivity growth has slowed.** After averaging close to 3% per annum in the 1980s and 1990s, labour productivity growth has slowed to around 1½% per annum since 2000. Output growth has remained resilient, helped by growing inputs (mostly employment) and more efficient combination of labour and capital (total factor productivity (TFP)).



The accompanying chart uses a growth accounting approach to depict the contribution to growth in terms of capital and labour inputs as well as how efficiently they are combined (TFP). Labour inputs and TFP declined around the time of the GFC but have subsequently recovered. **Capital investment in New Zealand has been slow to climb since the global financial crisis (GFC), and this looks to be a key contributor behind sluggish labour productivity growth**, with the latter averaging 1.7% per annum since 2010 as opposed to 2.1% per annum prior to the GFC. Growth in the capital stock has averaged less than 2% per annum since 2010, as opposed to the 3%+ per annum average since the early 1990s**. The slowdown in labour productivity growth since the GFC has been a common occurrence for many OECD countries.** It may also have implications for the comparatively low level of real interest rates observed in recent years.



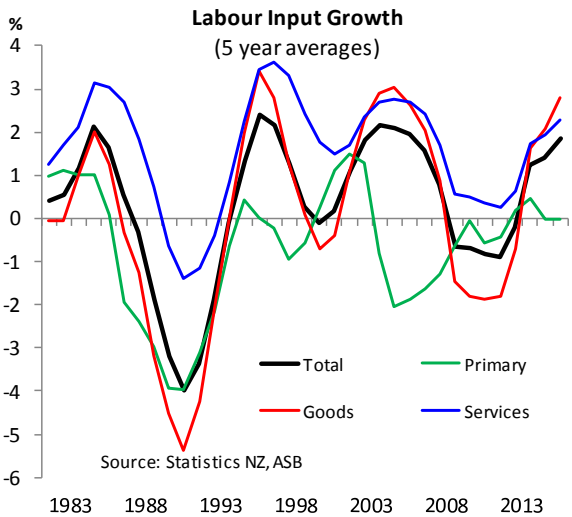
By contrast, total factor productivity growth for the measured sector since 2010 (1.2% per annum) has been stronger than its average since the early 1990s (1.0%). In other words, we have been getting better at extracting more per worker despite sluggish growth in the capital stock.

Performance has been uneven across sectors

Here, we split up measured sector output into three broad groups, including:

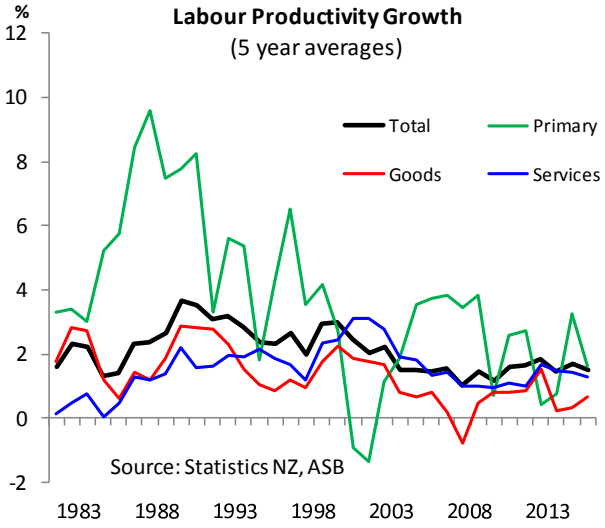
- Primary sector- about 10% of paid hours in the measured sector (2.3% growth per annum in labour productivity since the early 1990s). It includes the agriculture, forestry, fishing and mining industries.
- Goods sector – just under 30% (1.0% per annum). It includes manufacturing, construction and electricity, gas and water.
- Services sector – Just over 60% (1.7% per annum). Everything from transport, ICT and retail to administrative services.

Comparing the trend growth (we use a 5-year average) in paid hours

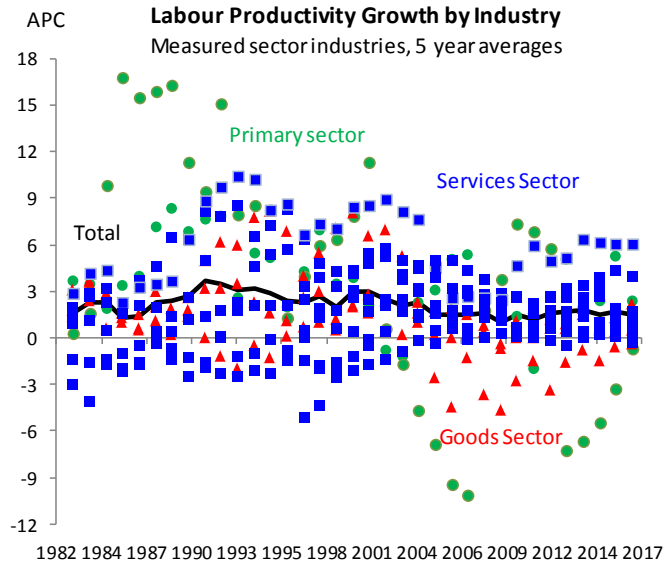


[1] For our analysis we mostly use figures published for the "former measured sector" given its more lengthy available time series.

shows growth has typically been more rapid for the services sector than for the others, although recent strengthening of paid hours in the construction sector has underpinned a trend increase in hours for the goods sector. **Labour productivity growth is almost a mirror image of labour inputs. A generalised slowdown has been evident in labour productivity since the 1990s.** A similar profile is evident for total factor productivity growth. Over the last decade or so, the goods sector has tended to underperform.

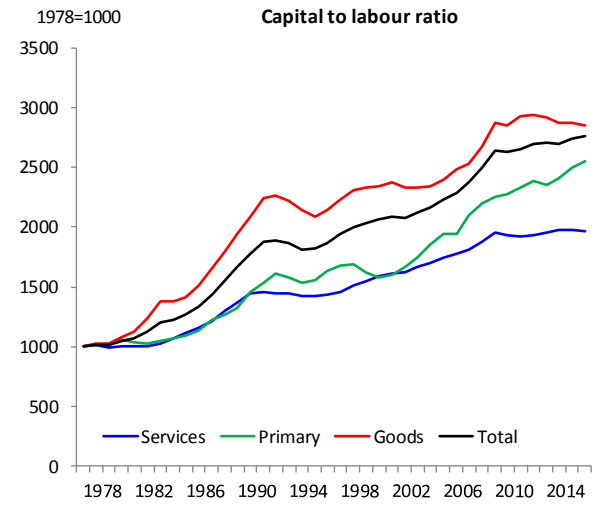


With the odd exception, the slowdown has been reasonably generalised across most industries. The slowing in labour productivity growth has also resulted in smaller variation in annual productivity growth by industry compared to the mid-1980s when the economy went through a marked period of structural change, with changes particularly pronounced in the primary and services sectors. Slowing labour productivity in mining has dampened primary sector labour productivity, with productivity performance in the agriculture, forestry and fishing still higher than the total. The moderation in the goods sector is due to weaker productivity for the manufacturing and electricity gas and water industries. Labour productivity performance was a mixed bag in the services sector, which has some of the strongest (Information and Communications Technology (ICT), retail trade, transport, financial and insurance services) and weakest performers (administrative and support services, education and training, accommodation and food services). The days of double-digit gains in labour productivity for strong performers look to be behind us.



Source: Statistics NZ, ASB

As mentioned previously, **the major driver for slowing labour productivity growth since the GFC has been the deceleration in physical capital accumulation**. Capital intensity per hour worked has generally been on an upward trajectory, but a plateauing has been evident since the GFC for the services and goods sectors. The sector splits reveal that the deceleration in capital accumulation largely reflects the halving in capital accumulation in the goods sector (1.5% per annum since 2010), which has been driven by slowing growth in the capital stock in the manufacturing (0.4% since 2010) and construction sectors (1.4% per annum versus 3.4%). Capital accumulation in the services sector was also lower (2.1% per annum versus 3.5%), but it has remained close to long-term averages for the primary sector (1.8% per annum).



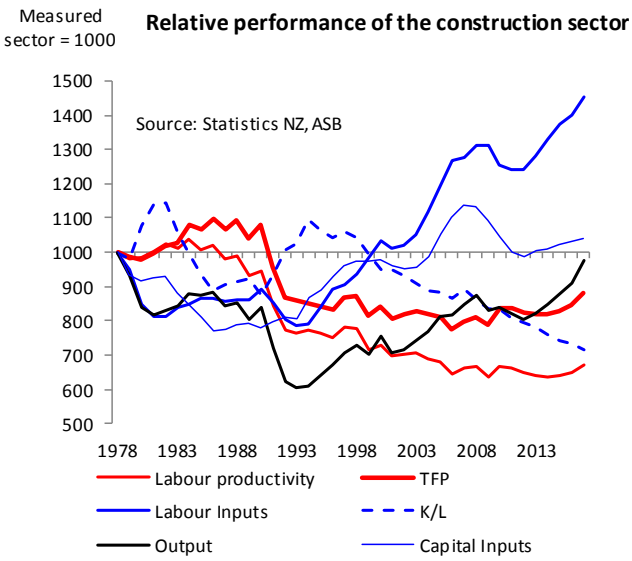
Source: Statistics NZ, ASB

Total factor productivity (TFP) growth has remained close to historical averages for the measured sector since 2010. However, the sector splits reveal a notable deceleration in productivity growth in the primary sector (0.2% per annum versus 2.4% per annum since 1992). **Goods sector TFP growth has actually strengthened compared to its early 1990 averages** (1.0% per annum versus 0.3% per annum), reflecting an improvement in both the manufacturing (0.8% per annum versus 0.3% per annum) and construction sector TFP (2.6% per annum versus 0.8% per annum). TFP growth in the service sector has also modestly strengthened since 2010 (1.2%

per annum versus 0.7% per annum).

The construction sector, which has traditionally been a productivity laggard and source of pricing pressure, has shown recent signs of improvement. Labour productivity and TFP in this sector outperforming that for the overall measured sector despite relatively stronger increases in employment. There is considerable ground to make up given the poor performance of the sector in the 1980s and 1990s. It is difficult to reconcile improving productivity in the sector, with still-high readings for construction cost inflation and the well-publicised difficulties of some of the major players. Time will tell whether this improvement can be sustained and whether pricing pressure from this sector will continue to cool. Recent developments, including advances in modular building techniques could potentially help lengthen the duration of the construction sector upswing.

Relative performance of the construction sector



Has there been a structural break since the GFC?

The charts in the following pages show some dot plots comparing industry trends since the mid-1990s and from 2010. It is still early days and our approach is reasonably simple, but it can be useful for identifying whether trends have been reasonably uniform across individual sectors and whether relationships have changed since the GFC.

Some stylised facts emerge:

- The growth in labour hours paid is still positively related to output growth. Since 2010, this relationship is not as tight as it has been historically over the post-GFC period.
- There is a negative relationship between increased labour inputs and labour productivity. However, this relationship looks to have weakened since 2010. This is also the case for the relation between labour inputs and TFP growth.
- Total factor productivity is positively related to overall output growth, with the relationship having tightened considerably since 2010.
- Capital deepening (more capital per worker) has typically been associated with higher labour productivity growth. Since 2010, however, no discernible positive relationship has been evident within the sectors.

Implications for future productivity growth

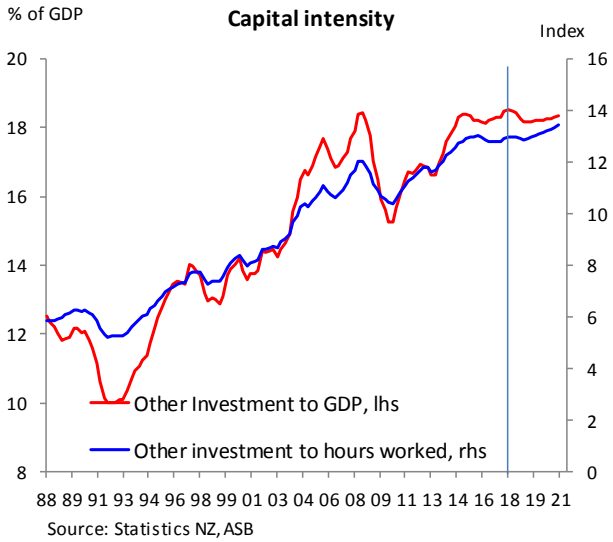
Given strong recent increases in employment, labour productivity growth is currently around a cyclical lull. Our expectation of a cyclical increase in labour productivity partly reflects an assumed increase in capital intensity. We also assume that new entrants to the labour market will experience faster growth in labour productivity than the wider workforce, bolstering wider labour productivity and TFP.

What about further ahead?

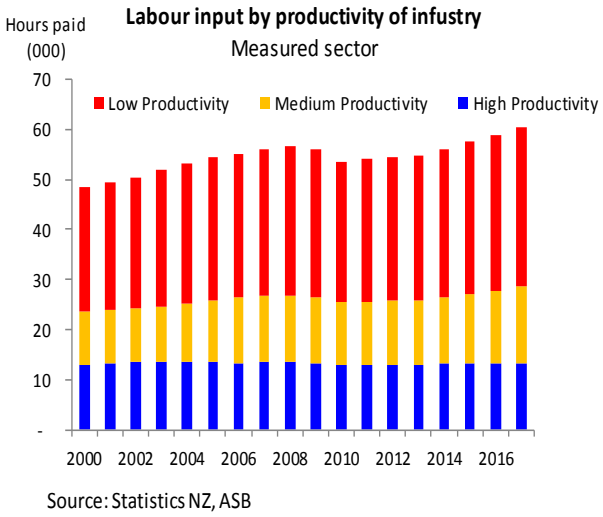
Beyond cyclical influences, the trend productivity growth rate for the economy will largely depend on the productivity levels of individual firms and how the structure of the economy evolves.

Viewing the employment shares according to the average long-run labour productivity growth of industry sectors shows a small shift in the labour market mix.

Capital intensity



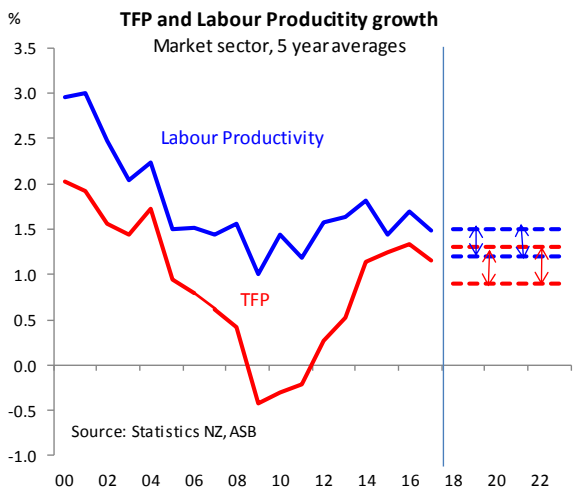
Here, we decompose the labour market in terms of the recent productivity performance of industry:



- High labour market productivity – industries where labour productivity growth has averaged more than 2% per annum since 2008. This includes employment in the agriculture, forestry fishing, retail trade and ICT industries. This accounts for about 20% of paid hours in the measures sector. Paid hours in this category have been flat since 2000 (+3% since 2010).
- Medium labour market productivity – industries where labour productivity growth has averaged 1-2% per annum since 2008. This includes construction, transport, finance, insurance and real estate services. This accounts for about one-quarter of paid hours. Paid hours in this category have increased more than 40% since 2000 (22% since 2010).
- Low labour market productivity – industries where labour productivity growth has averaged less than 1% per annum since 2008. This includes mining, manufacturing, electricity gas & water, professional and administrative services. More than half of measured sector paid hours are in this category. Paid hours in this category have increased by roughly 25% since 2000 (14% since 2010).

In viewing the shifts in the paid hours it is apparent that labour market inputs have been broadly static in the high labour productivity growth category since 2000. Close to 60% of the increase in paid hours has come from traditionally low labour productivity growth since 2000, with the remainder coming from medium labour productivity growth industries. These proportions are similar when we examine increases in employment since 2010.

By extrapolating forward growth in paid hours for each industry it is possible to derive "bottom up" estimates of trend productivity growth and total factor productivity growth for the measured sector. These estimates are intended to be illustrative as they are based on the assumption that past labour productivity growth rates are accurate predictors of future rates, with minimal changes in the labour market structure also assumed. **Our back of the envelope estimates suggest that trend growth in labour productivity in the measured sector could slow from the 1.7% per annum average since 2010 towards 1.2-1.5% per annum on average over the next few years.** Trend total factor productivity growth rates are also likely to be a fraction lower than their historical averages. **Assuming labour input growth of around 1.5% per annum over the next few years, this is likely to deliver trend growth in the measured sector of around 2.7%-3% per annum, below the approximate 3½% average of the last five years**

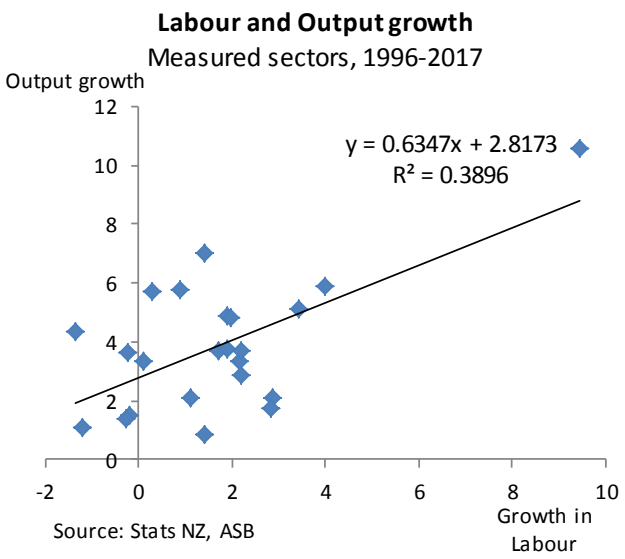


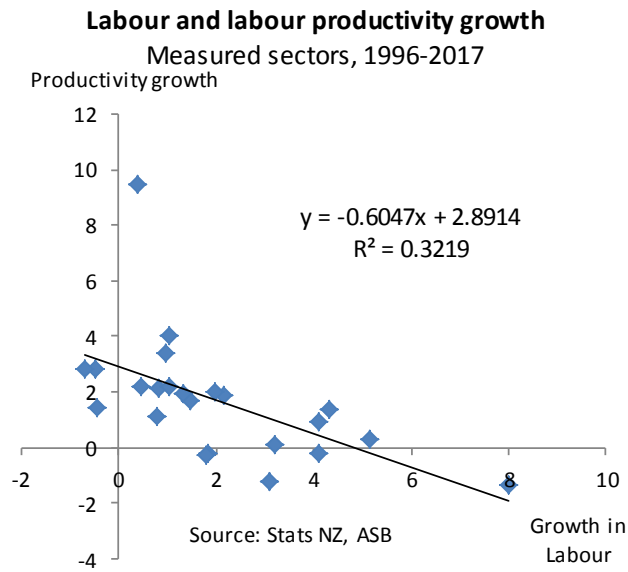
Monetary Policy Implications

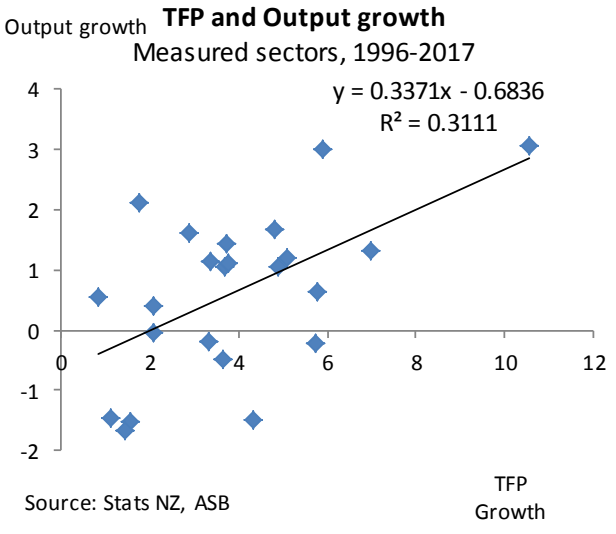
Our results tentatively suggests that as a consequence of a lower labour input *and* slower labour productivity growth, future potential output growth for the economy could turn out to be weaker than currently experienced A lower inflationary speed limit for the economy would imply a less favourable output and inflation trade-off. This could see inflationary pressure emerge earlier than in the current cycle, which may have implications for the timing and magnitude of OCR moves. Our analysis using industry data also tentatively suggests that relationships between productivity, output, and investment accumulation may have changed post the GFC. We are loathe to declare that this means that the usual historical relationships do not apply; it just means that policy makers may have to consider a wide number (of sometimes competing) perspectives. **For the RBNZ, this may mean focusing more directly on pricing dynamics and the factors impacting on inflation rather than relying on capacity metrics.** The costs of being less pre-emptive would need to be weighed against the potential benefits of not jumping at inflationary shadows.

Appendix: Industry plots

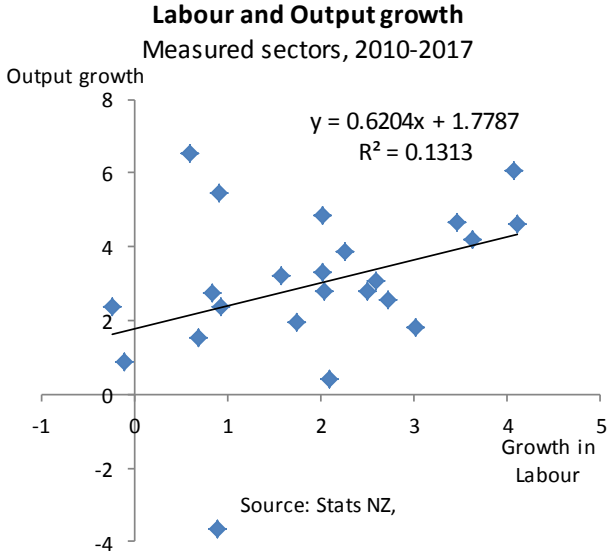
1996-2017 Annual averages

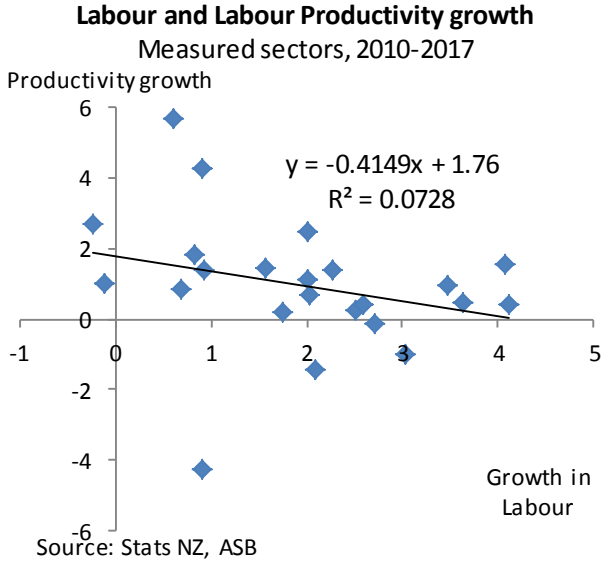


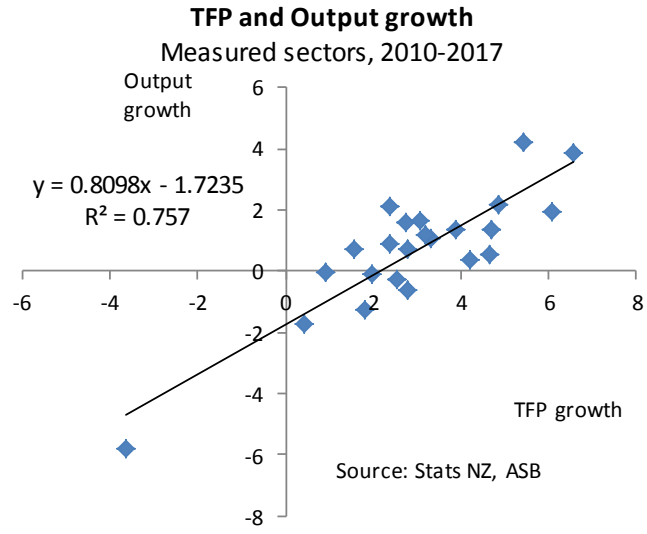




2010-2017 Annual averages

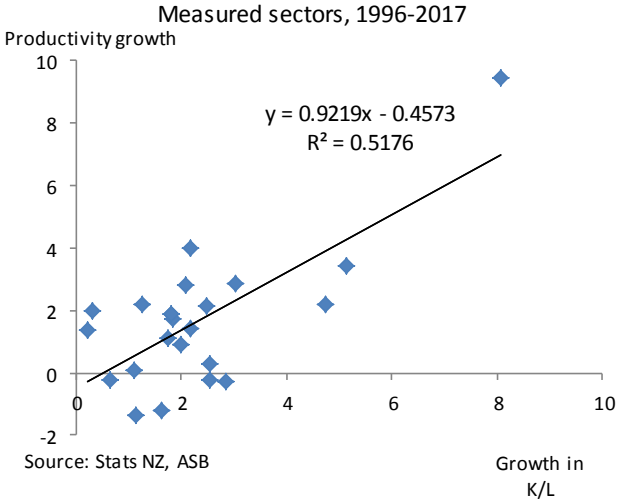




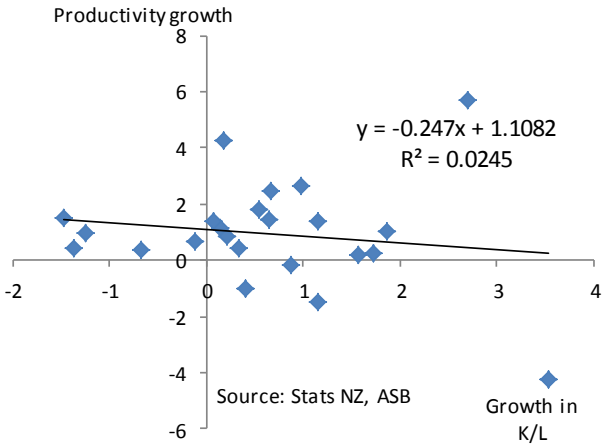


1996-2017 Annual averages	2010-2017 Annual averages

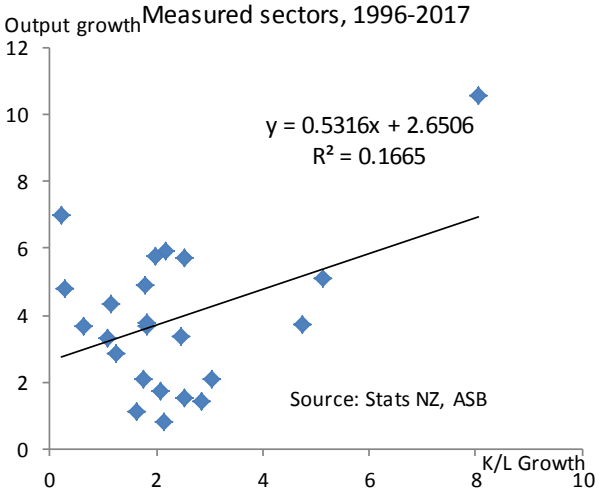
Capital deepening and labour productivity
Measured sectors, 1996-2017



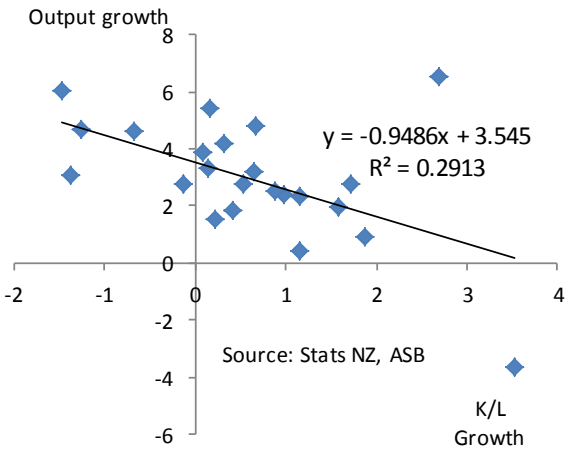
Capital deepening and labour productivity
Measured sectors, 2010-2017



Capital deepenening and Output growth
Measured sectors, 1996-2017



Capital deepening and Output growth
Measured sectors, 2010-2017



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