Holding Productivity Accountable

Business Dynamism and Productivity

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30 November 2018
UNSW EMG Workshop

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Labour Productivity*

Non-farm GDP per hour, March 1991 = 100, log scale, quarterly

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<td></td>
<td>100</td>
<td>118.70</td>
<td>119.67</td>
<td>121.50</td>
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*Black line represents a fitted line; numbers represent the annual geometric mean.

Sources: ABS; RBA
Role of business dynamism

• Literature on the importance of business dynamism has grown.
• Declining allocative efficiency – Riley, Rosazza-Bondibene and Young (2015)
• Decline of start-ups and entrepreneurship - Decker, Haltiwanger, Jarmin and Miranda (2016)
Question

• What is the role of business dynamism in Australian productivity growth?
Business dynamism

I consider two forms of business dynamism:

1) External – Exits and entries
2) Internal – Reallocation of resources from less productive to more productive firms
Data & Methodology

- Business Activity Statements (BAS) from BLADE.
- Coverage: Any business registered for GST
- Sample: FY 2001/02 - 2014/15
- Diewert and Fox 2010 decomposition
Decomposition – Diewert and Fox 2010

• Let labour productivity for firm $i$ in period $t$ be:
  \[ \Phi_{i,t} = \frac{y_{i,t}}{l_{i,t}} \]

• For each time period ($t$), let there be three groups:
  1) Entrants ($e$)
  2) Exits ($x$)
  3) Survivors ($s$)

• Productivity for a given group ($g$) in period $t$ can be expressed as:
  \[ \Phi_{g,t} = \sum_{i \in g} \frac{l_{i,t}}{\sum_{d \in g} l_{d,t}} \Phi_{i,t} = \sum_{i \in g} \omega_{i,g,t} \Phi_{i,t} \]
Decomposition – Diewert and Fox 2010

• Using some algebra we can decompose the change in productivity as:

\[
\Delta \Phi_t = \Delta \Phi_{s,t} + \sum_{i \in e} \omega_{i,e,t} (\Phi_{i,t} - \Phi_{s,t}) + \sum_{j \in e} \omega_{j,x,t-1} (\Phi_{s,t-1} - \Phi_{j,t-1})
\]

Where:
• \( \Omega_{g,t} \) is the employment share of the group \( g \) relative to aggregate employment
Decomposition – Diewert and Fox 2010

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\[
\Delta \Phi_t = \Delta \Phi_{s,t} + \Omega_{e,t} \sum_{i \in e} \omega_{i,e,t} (\Phi_{i,t} - \Phi_{s,t}) + \Omega_{x,t-1} \sum_{j \in x} \omega_{j,x,t-1} (\Phi_{s,t-1} - \Phi_{j,t-1})
\]

Where:

• \( \Omega_{g,t} \) is the employment share of the group g relative to aggregate employment
• Contribution of survivors can be decomposed further

\[ \Delta \Phi_{s,t} = 0.5 \sum_{k \in s} (\omega_{k,s,t} + \omega_{k,s,t-1})(\Phi_{k,t} - \Phi_{k,t-1}) + 0.5 \sum_{k \in s} (\omega_{k,s,t} - \omega_{k,s,t-1})(\Phi_{k,t} + \Phi_{k,t-1}) \]

within-change in productivity level

between-change in labour shares
Decomposition – Diewert and Fox 2010

\[ \Delta \Phi_t = \text{survivor contribution} + \text{entrant contribution} + \text{exit contribution} \]

\[ = \text{common productivity} + \text{internal dynamism} + \text{external dynamism (entrants + exits)} \]
A few caveats

- Financial, agriculture and public sector are excluded
- Negative GVA firms are zeroed
- Outliers have been trimmed
- Entrants are not necessarily new firms
- Exits haven’t necessarily exited.
Aggregate
All sectors
Productivity Growth by Industry
Average 2002 to 2015

- Mining
- Accommodation
- TPW
- RHR
- Education
- Admin
- Other
- Manufacturing
- Retail
- Professional
- Wholesale Trade
- Health
- Arts
- IMT
- Utilities
- Construction

- Dots represent average productivity growth.
- RHR is Rental, Hiring and Real Estate; TPW is Transport, Postal and Warehousing; IMT is Information Media and Telecommunications.

Sources: ABS; RBA
Survivor Productivity Growth by Industry

Average 2002 to 2015

Mining
Education
Accomodation
Admin
TPW
RHR
Other
Manufacturing
Professional
Retail
Wholesale Trade
Health
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Utilities
Construction
Arts

Dots represent average survivor productivity growth.

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Sources: ABS; RBA
Discussion

• Over time survivors have driven productivity growth
  – Common factor dominates
  – Internal dynamism is consistently positive but small
  – Exits added to productivity growth by exiting
  – Entrants subtract from productivity growth

• Industry level analysis reveals the importance of internal business dynamism
Do entrants subtract from productivity?

- The decomposition can only classify a business as an entrant in its first year.
- Ignores subsequent contribution of entrants.
Future research

- Age, cohort, time analysis
- Survivor modelling
- Drivers in the volatility of survivors productivity
References


Comments or Questions?