

Labour productivity dispersion and allocative efficiency in Luxembourg.

Chiara Peroni & Giovanni Mangiarotti (STATEC &
STATEC Research)

Luxembourg, 21st November 2022

STATEC
RESEARCH

STATEC

Why the productivity slowdown?

Features of productivity in Luxembourg:

- **Productivity dispersion:** differences in productivity among similar businesses over time.
- **Allocative efficiency:** allocation of resources (labour) among firms.

- OECD: evidence from cross-country firm-level data highlights increasing dispersion and low firm dynamics as sources of productivity slowdown.
- Luxembourg?

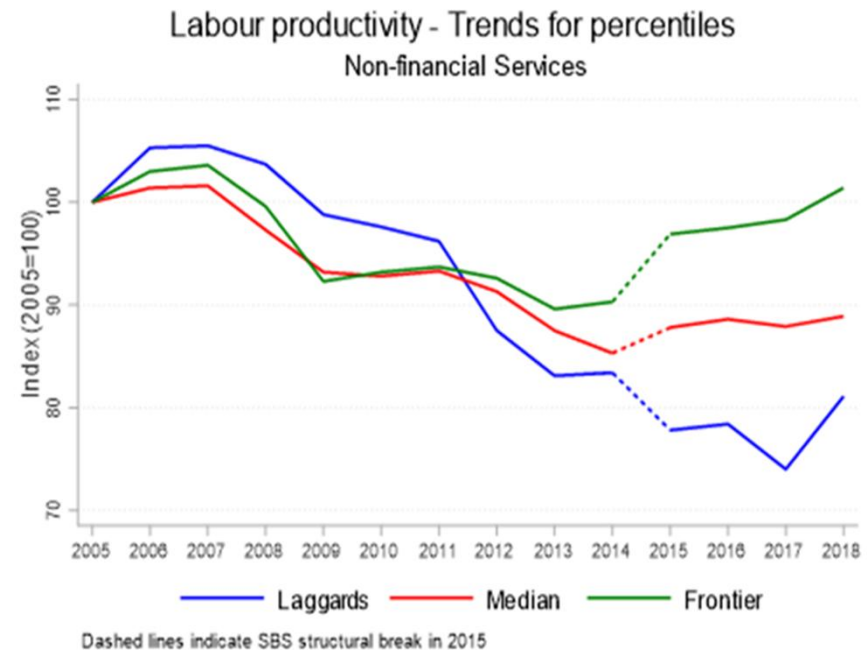
Data and measures of productivity

- Firm-level data: [Structural Business Statistics \(SBS\)](#) data for 2005-2018.
- Analysis conducted for Manufacturing and [Non-financial services](#) in Luxembourg - reveals differences across sectors.
- [Labour Productivity \(LP\)](#) at firm level is [Value Added \(VA\)](#) per person employed.

Productivity dispersion increases over time

- General fall in 2008-2009 and 2011-2013, compatible with Eurozone double dip recession.
- After 2013 faster rebound of frontier firms compared to medians.
- Persistent decline for laggards.

à Laggards less resilient to downturns.
à Overall evidence for increasing dispersion in recent years.
à Recovery of frontier firms and protracted decline of laggards.

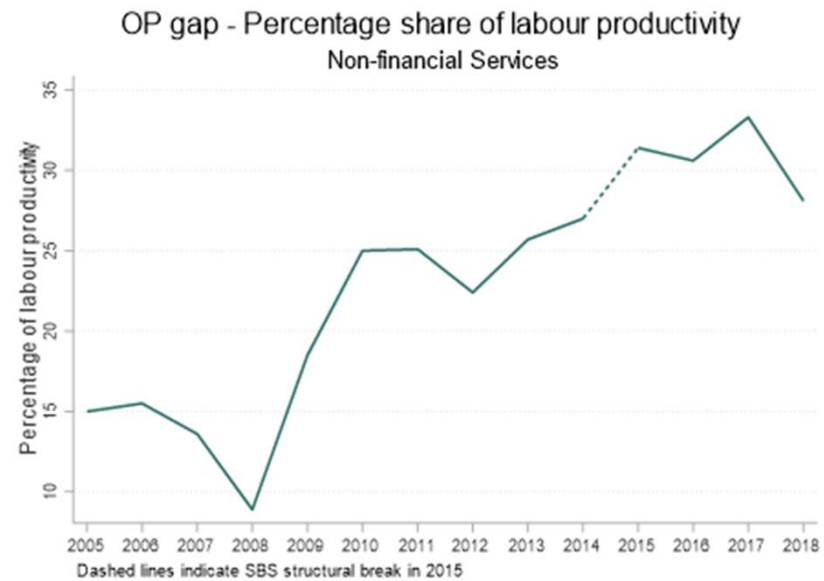


Allocative efficiency - based on OP decomposition

- Allocative efficiency is **relationship between firm size and productivity** - Aggregate productivity improves if more productive firms occupy a larger proportion of workers.
- **Olley-Pakes (OP) productivity decomposition** (1996, Econometrica) provides widely adopted empirical measure of allocative efficiency.
- Aggregate productivity level = firm average productivity + allocative efficiency.

Allocative efficiency improves after the recession

- Share of aggregate productivity attributed to allocative efficiency.
- Decreases to minimum levels during the financial crisis.
- Improves in subsequent years.
- Static measure.

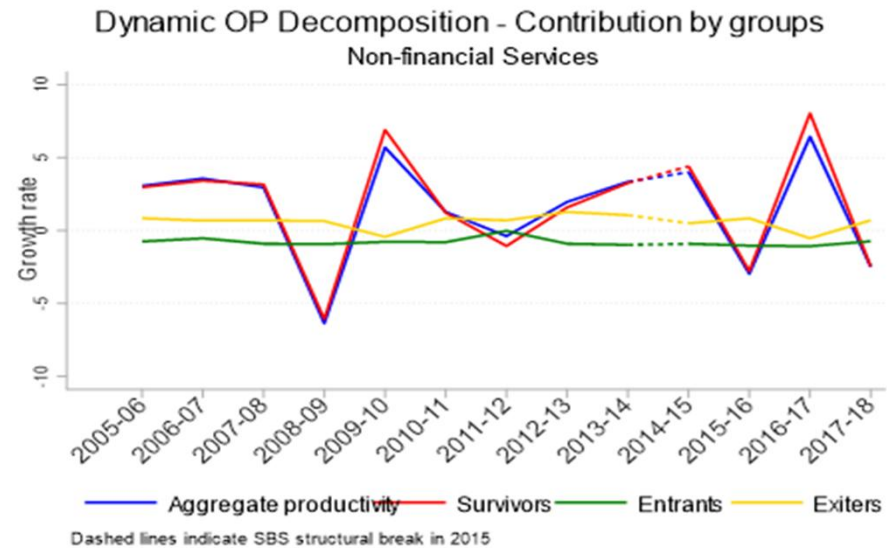


Extension: business dynamics and productivity

- To evaluate role of business dynamism (entry, exit) in productivity.
- Dynamic OP productivity decomposition (Melitz and Polanec, 2015).
- Productivity change between two periods is decomposed into the contribution of **Survivors, Exiters, Entrants**.

Business dynamics in non-financial services

- Survivors account for a large portion of the aggregate productivity change.
- The contribution of exiters is positive for most periods (i.e. firms that exit the market have lower productivity than survivors).
- The contribution of entrants is negative throughout the period (but.. short time frame / smaller average size of entrants).



Extension: productivity and wages

- Extend firm-level analysis of labour productivity dispersion to wage dispersion and relation between the two.
- Based on work done at the OECD (Berlingieri, 2017).
- Correlation and statistical association between dispersion in the two variables.
- **Positive and significant association between wages and productivity** for both manufacturing and non-financial service.
 - à More productive firms tend to pay higher average wages.


Conclusions - features of labour productivity evolution in Luxembourg


- **Increase in productivity dispersion** detected for non-financial services in more recent years. Dispersion less pronounced for manufacturing.
- **Positive evolution in allocative efficiency** for both manufacturing and non-financial services in post-crisis period.
- Recovery associated with positive developments in allocative efficiency of **survivors**. **Data also suggest contribution of market selection.**


STATEC

Institut national de la statistique
et des études économiques

THANK YOU/MERCI!

 13, rue Erasme
L-1468 Luxembourg

 (+352) 247-84219

 info@statec.etat.lu

Based on contribution appeared on
Luxembourg's National Productivity Board
Report, 2020 and 2021 release.

Giovanni Mangiarotti

Chiara Peroni

statistiques.public.lu



Acknowledgements

- We thank Georges Zangerlé for invaluable help with SBS data and for insightful comments on the results.
- We thank the OECD for allowing the use of a portion of the STATA code and the thresholds to correct for implausible jumps implemented in the MultiProd projet (Berlingieri et al., 2017).

Bibliography

Berlingieri, G., Blanchenay, P., Calligaris, S., and Criscuolo, C. (2017), “The Multiprod project: A comprehensive overview”, OECD Science, Technology and Industry Working Papers, 2017/04, OECD Publishing, Paris. <http://dx.doi.org/10.1787/2069b6a3-en>

Melitz, M. J., and Polanec, S. (2015). “Dynamic Olley-Pakes Productivity Decomposition with Entry and Exit.” *The RAND Journal of Economics*, 46 (2): 362–75.

Olley, G., & Pakes, A. (1996). The Dynamics of Productivity in the Telecommunications Equipment Industry. *Econometrica*, 64(6), 1263-1297. doi:10.2307/2171831