Selection and Agglomeration Impact on Firm Productivity: A Study of Taiwan's Manufacturing Sector

By

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Introduction

Firms in large markets have higher productivities. This has been traditionally attributed to agglomeration economies. However, another factor causal this higher productivity could be on account of selection due to competition which may cause the firms of low productivity to exit from the large market.

Science parks are planned clusters where firms are likely to benefit from agglomeration namely sharing, pooling and knowledge spillovers.

Objectives/Questions

• Are the firms located in a science park leading or lagging the ones located in large and small cities in terms of Total Factor Productivity (TFP).

• How the agglomeration and selection parameters affect the firm’s TFP.

Methods

• Measuring firm’s log TFP using Olley and Pakes (1996) and IV/2SLS methods to control for simultaneity and selectivity bias.

• Comparing TFP distributions using summary stats and non-parametric quantile - quantile plots.

• Using IQR, median and 10th percentile to measure dispersion, shift and truncation the TFP distributions.

• Regressing the above measures to determine the impact of agglomeration and selection on firm’s TFP.

Results

• Kernel density plot of TFP distributions indicate that science parks lag the firms in large cities.

• Box-plots of TFP distributions

• The linear QQ-plot indicates similarity in the distributions

Conclusion

Firms located in science park have a mean TFP lagging those of large cities and leading those of small cities.

Firms located in science parks benefit from localization and specialization.

Firms located in large cities benefit from diversification but are negatively affected by localization due to higher competition.

County market Mean TFP
County-level Labor Density

Fitting log-TFP distribution shows that it is close to log-logistic (figure below)

Legend: AM: LARGE CITY, BM: SMALL CITY, SP: SCIENCE PARK

References


Fujita, Masahisa and Masahiro Ogawa. 1982. Multiple urban configurations. Econometrica


