Introduction to modern input-output analysis

Summaries of two research papers

Source of summarized papers: https://ideas.repec.org/f/pla607.html

Paper 1:

Gurgul, Henryk & Łukasz, Lach, 2011. "**Financial development and economic growth in Poland in transition: causality analysis**," MPRA Paper 38034, University Library of Munich, Germany.

Paper 2:

Gurgul, Henryk & Lach, Łukasz, 2015. "**Key sectors after a decade of transformation: Evidence from Poland**," MPRA Paper 72739, University Library of Munich, Germany.

Summaries by Karol Oleszek

Financial development and economic growth in Poland in transition: causality analysis

Research goal

Explore and examine bilateral causal relationship between development of financial sector and economic growth in Poland, using time series from period Q1 2000 - Q4 2009. Search for causality using two approaches: bank-based and stock market based. Test for direction of explored relationships, their presence in short and long-term. Ensure robustness of findings using additional econometrics tests. Explore topic in regional setting of CEE area using example of Poland as biggest economy in region. Analyse results with consideration of transitional nature of CEE economies in search of regulatory propositions and recommendations for economies in the state of transition.

Methods used

In this paper several econometrics methods were used to test causality linkage in investigated field included linear (short and long run) and *nonlinear, Granger causality tests.* The tests were divided into two sets, each testing linkage between respectively GDP and bank sector development, GDP and stock market development. Six different aggregated measures were used to describe level of progress in each area (economic growth, bank sector development, stock market development). Duplicated measures in some areas were used to ensure robustness of findings.

Results/empirical findings

Causality tests application have revealed strong causal linkage from economic growth to development of banking sector, and from stock market development to economic growth. Long term test uncovered that short term volatility on stock market had little impact on economic growth and thus arguments thesis that stock market development plays crucial role in effective resources allocation and fostering economic growth and development as proposed in literature.

Second finding about causal linkage from economic growth to development of banking sector and financial services supports thesis that economic and industrial growth is postponed with growing demand for banking and financial services.

Conclusions

Taking into considerations used models limitations and results of robustness tests, one can quite confidently identify stock market development as an important and positive factor in stable economic growth in Poland in period of Q1 2000 - Q4 2009.

High economic growth and development increases needs for financial services and therefore strong banking sector is an outcome of GDP growth rather than a prequisity (stock market may play that role).

No causal linkage have been found between banking sector growth and fostering GDP growth which may indicate that financial sector deregulation may not be powerful policy for countries undertaking major economic system transition.

Key sectors after a decade of transformation: Evidence from Poland

Research goal

Explore changes and trends in key sectors in post-transitional economy of Poland. Test three hypotheses:

1) Agriculture kept key sector status, but its importance have been declining,
2) Industry and manufacturing lost its importance in favor of service related sectors (construction, tourism, financial services),
3) 2004 Polish European Union accession fostered transition to service-oriented economy due to inflow of EU structural funds and access to shared market.

Hypotheses are tested using sectoral data.

For each hypotheses set of conditions is predefined including linkage analysis, sectoral changes direction threshold.

Methods used

Research paper is based on analysis of sectoral IO tables from given period. Analysis in paper is based on Leontief Input-Output model.

Key sectors are identified using input-output multiplier matrix and forward/backward linkages.

Maximum Entropy Decomposition is used to identify underlying factors composing Leontief Inverse of IO model.

Sensitivity testing is applied to IO model to identify changes in model.

IO tables from Polish Central Statistical Office including 55 sectoral information were used in analysis.

Results/empirical findings

Cross-sectoral linkage calculations revealed only partial evidence for formulated hypotheses.

Analysis supports hypothesis 1: forward and backward linkages classify agriculture as key sector, and its linkages are declining.

Heavy industry sectors like metallurgy and mining lost some of its importance, however oil and gas processing, chemical processing etc. analysis did not express such trends.

Analysis of sectors considered in hypothesis 3 shows little but no evidence supporting it.

Sectors where not yet classified as key sectors and some of linkages declined significantly by large degree, while others increased.

Entropy decomposition and sensitivity tests provides both supporting and contradicting arguments for hypothesis 3.

Conclusions

Detailed study of sectoral linkage information reveals key sectors in Poland and shift in importance of biggest sectors.

Agriculture sector has kept its key sector status, but is losing its significance.

Poland has avoided to high degree deindustrialization process experienced by other post-transitional economies. Chemical processing industry has gained more importance in analyzed period.

European Union accession of Poland has had positive impact on importance of services sectors of economy, especially tourism, transport, etc.