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# Is there an export or import-led productivity growth in rapidly developing Asian countries? a multivariate VAR analysis

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## Abstract

In contrast to cross-country studies, the paper investigates the relationships between trade and labour productivity for nine rapidly developing Asian countries in a time-series framework using a vector error-correction model. Independent tests on the long-run and short-run relationship between trade variables of exports and imports and productivity are conducted. The results suggest that trade has an important impact on productivity and output growth in the economy, however it is imports that provide the important 'virtuous' link between trade and output growth. The results indicate that exports and imports have qualitatively different impacts on labour productivity. The long-run result shows that there is no causal effect from exports to labour productivity growth for Hong Kong, Indonesia, Japan, Taiwan and Thailand; thereby suggesting that there is no export-led productivity growth in these countries. However, significant

causal effects were found from imports to productivity growth, suggesting import-led productivity growth in India, Indonesia, Malaysia, Philippines, Singapore and Taiwan. In addition, the results indicate that imports tend to have greater positive impact on productivity growth in the long run.

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## Notes

See Rodriguez and Rodrik (1999) for a discussion of the weakness of the various openness measures used in the empirical studies on openness and economic growth.

Other indices used in most studies on openness and productivity growth are World Development Report Outward Orientation Index, Average Black Market Premium, Average Import Tariff on Manufacturing, Wolf's Index of Import Distortions, Average Coverage of Non Tariff Barrier, etc.

The price deflators are collected from the respective countries' Statistical Yearbooks, if it is not available in the World Data or the World Development Indicators.

Total factor productivity (TFP) could be used as one of the measures of productivity. However, due to lack of data on investment in fixed assets and capital stock for most of the countries under study, we could not derive a long time series for TFP.

Since the data on imports of intermediate inputs are not available for all countries in the sample, total imports are used in the analysis. In addition, the imports of varieties of final goods could be an important source for domestic firms and producers to unbundled new technology embodied in final goods.

In Luintel and Khan ([1999](#)) the sample of 38 annual observations is used to study the causal effects between financial development and economic growth. Masih and Masih ([1996](#)) had a sample of 37 annual observations to study the impact of monetary aggregates on output growth in a VAR framework for the Indonesian economy. The

sample in the study is comparable to most time series studies related to economic growth. In addition, most of the output and employment data for the Asian countries are only available from the 1960s and hence all available information is used in the current study.

We can perform three different types of causality test depending on the source of causality. The standard Granger causality test is a joint test on the significance of the short-term lagged difference variables. One could also perform a test of the statistical significance of the lagged cointegrating vector and the error correction term (Luintel and Khan, [1999](#)). This is a test of weak exogeneity. The other test of causality is a strong exogeneity test and is undertaken in the current study; this places greater restrictions on the test for causality.

The strong exogeneity test is only conducted jointly with the lagged difference variables ( $\theta_{ij}$ ) and coefficient of the error correction term ( $\alpha_{ij}$ ).

The magnitude of the cointegrating vectors will change with the normalizing variable, but the statistical significance will not change with normalization.

The different hypotheses concerning  $\alpha$  and  $\beta$  have been discussed at length in Johansen and Juselius ([1990](#)) and in Johansen ([1991](#)).

When  $r = 1$ , the test statistic follows  $\chi^2$  with one degree of freedom.

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