AN INVESTIGATION OF THE EFFECT OF INWARD FOREIGN DIRECT INVESTMENT ON THE PERFORMANCE IN THE CHINESE ELECTRONIC INDUSTRY

By

SHENG (WILLIAM) LIU
BA (GDUFS, China), MIB (Wollongong, Aust.)

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DECLARATION OF AUTHORSHIP

I declare that the work embodied in this thesis is the result of original research and has not been submitted for a higher degree to any other university or institution.

I certify that, to the best of my knowledge, any help received in preparing this thesis and all sources have been acknowledged in this thesis.

SHENG (WILLIAM) LIU
The objective of this thesis is to empirically investigate the impact of inward foreign direct investment (FDI) on economic growth and total factor productivity in the Chinese electronic industry (CEI). In the past three decades, there have been massive FDI flows into developing countries, as a consequence of global financial and political transformation. During this time, China emerged as the second largest destination for FDI in the world, spurred on by the major policy and institutional reforms implemented in 1978. Since then, FDI flows into China have transformed the economy, resulting in significant growth in a number of sectors. The most notable features are that between 1978 and 2010, the CEI experienced an average growth of about 20% per annum and an improvement in productivity. Despite a growing number of studies that have examined the impact of FDI on economic growth and productivity in host economies abroad and in China, no recent study, in the author’s view, has been undertaken in the case of China, and most importantly the Chinese electronic industry, under recent changing economic conditions. This study aims to bridge the knowledge gap by empirically investigating the extent to which FDI has impacted on economic growth and productivity in the CEI.

This study contributes to the endogenous growth literature by incorporating human capital deepening and learning-by-doing into the traditional endogenous growth model to assess economic growth and total factor productivity for the CEI. Two further empirical extensions of endogenous growth modelling are the specification of macroeconomic and microeconomic theoretical frameworks to explain the impact of FDI on economic growth and total factor productivity in the CEI, respectively. Two sets of data are employed in the empirical analysis. For the macroeconomic model, data from 29 provinces in China and spanning the period 1989-2009 are used in the analyses. For the microeconomic model, data from 1238 firms and spanning the period 2003-2008 are employed in the analyses. To ensure reliability in the estimation, panel unit root and cointegration tests are performed. Based on the unit root and cointegration results, this study deploys four estimation methods to estimate the models, namely, Panel Least Squares (PLS), Estimated Generalized Least Squares...
(EGLS), Two Stage Least Squares (TSLS) and Quantile Regression (QREG). The EGLS estimation is found to be superior to the other three estimation methods. This study also extends the analysis by testing for Granger causality between dependent and independent variables.

There are six key findings of the macroeconomic analyses. First, FDI is found to be positively associated with economic growth in the CEI. More importantly, there are three channels by which FDI impacts on economic growth, namely, foreign capital, FDI-related employment and number of foreign invested firm. Second, foreign capital has a greater effect on economic growth in the CEI than the other two channels. This effect is more pronounced in the western region, compared to the other regions in China. However, in the western region an increase in the number of foreign invested firms is negatively related to economic growth in the CEI. Third, human capital is positively associated with economic growth in the CEI. Fourth, exports stimulate economic growth in the CEI. Fifth, there is an FDI spillover effect and this is reflected in increased export and human capital development. Sixth, locational characteristics are also key factors enhancing the impact of FDI on economic growth in the CEI.

For the microeconometric analyses, the key findings are summarised. First, the FDI spillover effects on total factor productivity (TFP) in the CEI are mixed. On the one hand, an increase in the ratio of foreign capital to total capital investment in the CEI promotes TFP. On the other hand, a rise in foreign employment relative to domestic employment has a negative impact on TFP. Overall, the results indicate the positive impact of FDI on TFP. Second, foreign equity participation enhances TFP. As well, foreign equity is capable of facilitating FDI spillover effects. Third, the growth in the productivity gap between domestic and foreign firms is negatively associated with TFP of firms in the domestic economy and also a main reason causing negative FDI spillover effects in the CEI. Finally, regional investment in Science and Technology (S&T) and fixed assets does impact positively on TFP in the CEI.
Several policy implications emanate from the macroeconomic analyses. First, to promulgate effective and efficient FDI policies, policy makers should consider the different channels by which FDI impacts on the CEI. Incentives should be designed to attract capital-intensive FDI projects and to encourage foreign firms to increase investment in less-developed western provinces. In addition, restrictions on local labour markets and investment thresholds should be abolished as this has the capacity to impact positively on FDI inflows and consequently on economic growth in the CEI.

Second, the Chinese government’s policies should continue to foster human capital development which also has the potential to encourage increased FDI inflows. Third, the Chinese government should continue to promote export through liberalisation of trade. This will raise competition among firms and thus encourage innovation with the effect being increased economic growth in the CEI. Fourth, the Chinese government should continue the policy agenda of increasing investment in S&T and infrastructure development in the western provinces. This could be helpful in attracting FDI inflows into China’s less-developed areas.

From the microeconomic analyses, several policy implications emerge. First, the Chinese government should encourage foreign equity participation into domestic firms as this leads to technological spillover effects on total factor productivity in the CEI. Effective governmental mechanisms can be put in place at the provincial level. Second, when evaluating how well FDI policies work on encouraging foreign investors into selected sectors, policies makers should be aware of different FDI impacts in the CEI depending on whether the context is macroeconomic or microeconomic. Third, to lower negative FDI impacts on productivity in the CEI, institutional reforms should devote more effort to reforming the current human resource management system. Fourth, it is imperative for policy consideration to narrow the productivity gap between domestic and foreign firms. A combined strategy can be adopted. This may include allocating more resources to support domestic firms’ R&D activities and keeping sufficient competitive pressure on technology updating. Finally, the Chinese government should strengthen the S&T policy agenda to further improve productivity in the CEI. The policies to be pursued may include increasing investment in local
innovative systems and establishing an effective mechanism to facilitate knowledge flows from research institutes to enterprises.
DEDICATION

With Love and Respect

To

My parents: Caiyuan Liu and Qiugui Long

My sisters: Maihua Liu and Lihua Liu
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<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>BIT</td>
<td>Bilateral International Treaty</td>
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<td>BPIS</td>
<td>Big Push Industrialisation Strategy</td>
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<td>CEI</td>
<td>Chinese Electronic Industry</td>
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<td>CIT</td>
<td>Centre for Information Technology, China</td>
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<tr>
<td>EGT</td>
<td>Endogenous Growth Theory</td>
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<tr>
<td>ETDZ</td>
<td>Economic and Technological Development Zone</td>
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<tr>
<td>FDI</td>
<td>Foreign Direct Investment</td>
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<td>FEP</td>
<td>Foreign Equity Participation</td>
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<td>FIE</td>
<td>Foreign Invested Enterprise</td>
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<td>FYP</td>
<td>Five-Year Plan</td>
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<td>GATT</td>
<td>General Agreement on Tariffs and Trade</td>
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<td>GDP</td>
<td>Gross Domestic Product (defined as value added)</td>
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<tr>
<td>GWDP</td>
<td>Great West Development Project</td>
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<tr>
<td>HID</td>
<td>High Intensity Discharge</td>
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<tr>
<td>HMT</td>
<td>Hong Kong, Macao, Taiwan</td>
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<td>IC</td>
<td>Integrated Circuit</td>
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<tr>
<td>IOT</td>
<td>Industrial Organisation Theory</td>
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<tr>
<td>IPRs</td>
<td>Intellectual Property Rights</td>
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<td>JV</td>
<td>Joint Venture</td>
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<tr>
<td>MEI</td>
<td>Ministry of Electronic Industry, China</td>
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<tr>
<td>MII</td>
<td>Ministry of Information Industry, China</td>
</tr>
<tr>
<td>MIIT</td>
<td>Ministry of Industry and Information Technology, China</td>
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<tr>
<td>MNE</td>
<td>Multinational Enterprise</td>
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<tr>
<td>NBSC</td>
<td>National Bureau of Statistics of China</td>
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<tr>
<td>OECD</td>
<td>Organisation for Economic Cooperation and Development</td>
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</table>
PCB  Printed Circuit Board
PEI  Provincial Electronic Industry
R&D  Research and Development
SEZ  Special Economic Zone
S&T  Science and Technology
SOE  State-Owned Enterprise
TFP  Total Factor Productivity
UNESCO  United Nations Educational, Scientific and Cultural Organization
WOE  Wholly Owned Enterprise
WTO  World Trade Organisation