PS2 Literature Review

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Research Topic: How do international economic activities between two countries impact a nation's innovation over time?

The first research paper I reviewed is 'International Trade, Economic Growth and Intellectual Property Rights: A Panel Data Study of Developed and Developing Countries' by Patricia M. Higino da Silva. Inspired by previous research studies, this paper tried to answer three questions. Firstly, it studied how international trade can impact a country's domestic innovation and growth through exposure to foreign technology. The second question is to find out the impacts of FDI inflows and IPRs in this process. The last question is to compare the different effects between developed and developing countries. The hypothesis is that import of foreign high technology goods, enforcement of intellectual property rights (IPRs) and foreign direct investment (FDI) would have positive effects on domestic innovation. The data used is a panel dataset consisting of 20 developed and 28 developing countries from 1970 to 1990, divided into four periods. In building up the innovation regression model, patents data is used as proxy for innovation, which is the dependent variables. Patent protection index for each country is a proxy for the enforcement of IPR. Other explanatory variables include import level of high technology goods from developed countries, import level of goods other than high technology goods, level of human capital, FDI and measure of a country's infrastructure. IV are used for most of the explanatory variables to solve the endogeneity problem and the random effects 2SLS estimation is adopted as the main regression model given the assumption that there is no correlation between latent individual effects and explanatory variables. Adaptions to the main model include incorporating dummy

variables on defining developed and developing countries.

The results show that there are significant differences in impacts of international trade on developed and developing countries. To sum up, high technology imports from foreign countries have significant positive effects on innovations in developed countries but not on developing countries. FDI inflows don't have direct impact on domestic innovation. IPRs have positive effects on developed countries and negative countries.

The paper might provide insights or guidance to my research question for the following reasons. Firstly, it made me think of the different effects on developed and developing countries, which led to a question investigating that causes the heterogeneity, which could be the differences in import components and restrictions on imports. Besides, the IVs used in this paper are also instructive. For instance, IVs such as earlier import values, exchange rate, measure of free trade openness are used for the imports of foreign goods in this model. They can help solve the problem of endogeneity. Despite that, I doubted if the conclusion that FDI inflows have no direct impact on domestic innovations is reasonable and would focus on validating the result in my research.

The second paper I reviewed is called ‘Enhancing national innovative capacity: The impact of high-tech international trade and inward foreign direct investment’ by Jie Wu, Zhenzhon Ma, Shuaihe Zhuo. This paper also studies the impact of international trade activities and intellectual property rights (IPR) on national innovation in leading innovator countries and emerging innovator countries using a dataset covering 80 countries in the time period from 1981 to 2010. The main model in this paper builds upon the framework developed by Furman and Hayes; in a closed economy, the latter framework states that a nation’s innovation level

is mainly determined by three factors: common innovation infrastructure, cluster-specific environment for innovation and quality of linkages, where common innovation infrastructure is further comprised of cumulative technological sophistication, human capital and financial resources available for R&D activity and also resources commitments and policy choices. Wu, Ma and Zhuo modifies this framework to let it fit in an open economy by incorporating international trade activities, foreign direct investment, index of a country's legal system (including measurement of IPR protection) and other control variables.

Interestingly, the paper used some different proxy variables from Furman and Hayes's paper to construct the theoretical framework. And the results reveal that imports of high technology goods and FDI have a significant impact on boosting innovation activities in emerging innovator countries while have no impacts on those in leading innovator countries. Also, IPR protections are beneficial for innovation in leading innovator countries and harmful for innovation in emerging innovator countries.

While the impact of IPR protection is in accordance with the results found in the paper by Patricia M. Higino da Silva, the role of FDI are different here (Silva's research showed no significant impacts of FDI on all countries). Despite the different datasets they use(different countries and time range), it is important to test which result is more valid in historical trends in my research. Interestingly, in Silva's paper, the countries are categorized based on different levels of income while the countries in this paper on categorized based on established innovation capital. It is important to further study whether developed countries are equal to leading innovation countries and developing countries are equal to emerging innovation countries in my paper. As the two studies use different proxy variables, which ones are better are worth further investigation. Also, the fact that they both simply choose to

use patents granted to a country by U.S. Patent Trade Office as proxy variables for a country's innovation level makes it legitimate to be used in future studies.

Other research papers study the impacts of international trade on innovation and knowledge diffusion in one individual country. A paper named 'Do Firms learn from International Trade' by Megan MacGarvie validates the positive impact of international trade on firm-level inventions in France by showing that firms with more patents tend to make citations and be cited by foreign patents. Other papers study the negative impacts of international knowledge flows in preventing domestic innovative activities. The paper 'Foreign Competition and Domestic Innovation: Evidence from U.S. Patents' showed that Chinese competition led to fall in innovation on firm levels by studying the changes of main patents concentration across sectors. These papers provide evidence that impacts of trade vary from country to country and also from industry to industry. How to study the impacts in stratified groups of countries and industries will be crucial to accurate estimation.

References

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