



Investment liberalisation, technology take-off and export markets entry: Does foreign ownership structure matter?



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ABSTRACT

Before and after its accession to the WTO in 2001, China has undergone a far-reaching investment liberalisation. As part of this, existing restrictions on foreign ownership structure and mandatory export and technology transfer requirements imposed on foreign firms have been lifted in a number of industries. Against this background we identify the causal effects of foreign acquisitions on export market entry and technology take-off and evaluate whether the level of foreign ownership plays a role in stimulating these changes. Using doubly robust propensity score reweighted bivariate probit regressions to control for the selection bias associated with firm level foreign acquisition incidences, we uncover strong but heterogeneous positive effects on export activity for all types of foreign ownership structure. We also find that minority foreign owned acquisition targets experience higher likelihood of R&D, providing evidence that joint ventures can contribute positively to China's "science and technology take-off".

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1. Introduction

There are a number of theoretical models that examine the host country welfare effects of foreign investment liberalisation (Markusen, 2004; Egger et al., 2007; McGrattan and Prescott, 2009). This literature has significantly enhanced our understanding of the mechanisms through which investment liberalisation can enhance growth. Two key mechanisms are identified in this respect: technological development and trade expansion. McGrattan and Prescott (2009) provide a theoretical analysis that shows that greater openness to FDI leads to substantial gains in the opening economy through the exploitation of investing countries' technology capital. Markusen (2004) predicts significant trade effects of foreign investment liberalisation, these effects being positive or negative depending on whether FDI is vertical or horizontal.¹

This paper contributes to this line of inquiry by evaluating the impact of foreign investment liberalisation on the probability that a firm enters exports markets for the first time, and the likelihood that a firm experiences technology take-off, which we define as engaging in R&D activity for the first time. We are mainly interested in analysing whether the degree of foreign ownership attracted by the firm plays a role in facilitating these processes. This is done by using a comprehensive

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¹ Amiti and Wakelin (2003) take this prediction to bilateral FDI and export data, and conclude that investment liberalization stimulates exports when countries differ in relative skill endowments provided trade costs are not too high.

firm level database covering enterprises in the Chinese manufacturing sector which allows us to identify the sub-population of firms with no exports, R&D and FDI before China joined the WTO in 2001. Some of these firms are subsequently partly or wholly acquired by foreign MNEs courtesy of investment liberalisation entailed by WTO entry, and we are able to trace the exporting and R&D transitions of individual firms between the pre- and post-acquisition periods.

Our empirical strategy exploits major changes in FDI policy following investment liberalisation in China. Firstly, the fact that restrictions on foreign ownership structure were lifted in a number of industries allows us to investigate the role of ownership structure on the FDI-export/R&D nexus. Secondly, the removal of mandatory export and technology transfer requirements imposed on foreign firms affords us the opportunity to more precisely identify the causal effects of foreign acquisitions on export markets entry and technology take-off.

It is well-documented that exports promotion and technology transfer are the two most important FDI policy objectives in China (Long, 2005). Macroeconomic figures would appear to suggest that the investment liberalisation process undergone by China in the run up to its accession to the WTO in 2001 were successful. By 2010, about 14 percent of global foreign direct investment flows went into the Chinese economy. China also accounted for roughly 10 percent of world-wide exports in 2010, making it the world's top exporter in that year (WTO, 2011). Over the same time, China has begun what Jefferson and Gao (2007) term its “science and technology (S&T) take-off”. Data available from the World Development Indicators also show that, between 1996 and 2007, China increased its R&D expenditures from 0.5 to 1.4 percent of GDP—making it comparable to many industrialized countries. Investigating the causal effects of foreign ownership structure on export entry and technology take-off during this investment liberalization period is therefore not only of academic merit but also highly policy relevant.

In order to evaluate the causal effects of foreign acquisitions on R&D and exporting, we implement a propensity score reweighting estimator (Hirano et al., 2003) combined with covariate adjustment, the so-called doubly-robust estimator (Bang and Robins, 2005). A major advantage of the doubly-robust estimator is that it provides correct identification even if either the propensity score or the conditional mean regression models are misspecified. The use of propensity score based methods – in most cases propensity score matching – to infer the causal effects of foreign acquisitions is not new to the applied international economics literature (e.g., Girma and Görg, 2007; Arnold and Javorcik, 2009). However, to our knowledge this is the first paper that combines propensity score weighing with covariate adjusted regressions, and thus exploits the opportunity this offers to obtain robust inference even under possible model misspecification.

Besides identifying causal relationships using an empirical method most appropriate to the demands of the data, this paper addresses a number of important issues that have either been under- or unexplored in the existing literature. Firstly, we investigate the R&D and export decisions jointly. Thus far, the literature on the effects of foreign acquisitions has tended to concentrate on either technology or exporting.² However, as Bustos (2011) and Hanley and Monreal-Pérez (2012) show theoretically and empirically, technology upgrading (through investments in R&D or skills) and exports are likely to be related. Firms may either upgrade technology pre-export entry to improve quality or post-export entry through learning effects.

Secondly, we look specifically at whether the degree of foreign ownership (or ownership structure) matters for technology upgrading and exports. This has, to the best of our knowledge, not received much attention in the literature. An exception is Thomas et al. (2008), who provide a descriptive analysis showing that foreign owners forming contractual agreements with local partners through joint ventures, equity joint ventures and joint stock enterprises are more successful in inducing new product developments than wholly owned firms. However, in their empirical approach they cannot claim to establish causal relationships. Another related paper is Guadalupe et al. (2012), who investigate the link between foreign acquisition and innovation activity using firm level data for Spain. They also use a propensity score reweighting estimator, though not a doubly-robust estimator. Also, in contrast to our paper, they do not investigate whether ownership structure matters.

Thirdly, a distinctive feature of our paper is the focus on new export markets entrants and first time R&D investors. Prior exporting and R&D experience or lack thereof could be a sign of some unobserved firm level heterogeneity, and it can be empirically difficult to disentangle state-dependence from acquisition effects. Thus focusing on changes in exporting and R&D status provides a cleaner identification strategy.

The remainder of the paper is structured as follows. Section 2 discusses investment liberalisation episodes in China and how these inform our study. Section 3 describes the firm level data we use and presents some descriptive statistics. Section 4 outlines the empirical methodology used. Section 5 discusses our main findings, and reports results from a number of sensitivity and robustness analyses. Some concluding comments are presented in Section 6.

2. Institutional background

We provide a brief description of the salient features of foreign investment liberalisation in China in order to show that China provides a very suitable test case to investigate the relationship between FDI, export entry and technology take-off.

² For example, a number of papers employing propensity score matching show that foreign acquisitions lead to productivity increases (Arnold and Javorcik, 2009) where the implicit assumption is that technology improvements drive these increases in productivity, or foreign acquisition lead to more R&D activities in order to prevent the expansion of domestic rivals (Bandick, Görg and Karpay, 2014). A number of studies also look at the relationship between acquisitions and exporting, see, for example, Du and Girma (2009) using firm level data from China.

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