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Gifted kids or pushy parents? Foreign direct investment and plant productivity in Indonesia ☆

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ABSTRACT

This paper analyzes the causal relationship between foreign ownership and various aspects of plant performance using micro data from the Indonesian Census of Manufacturing. It examines the implications of foreign ownership in two different contexts: foreign acquisitions and foreign privatizations. To control for the possible endogeneity of FDI decision propensity score matching is combined with a difference-in-differences approach. The results indicate that foreign ownership leads to significant productivity improvements in the acquired plants. The improvements become visible in the acquisition year and continue in subsequent periods. After three years, the acquired plants exhibit a 13.5% higher productivity than the control group. The rise in productivity is a result of restructuring, as acquired plants increase investment outlays, employment and wages. Foreign ownership also appears to enhance the integration of plants into the global economy through increased exports and imports. Finally, productivity improvements and evidence of restructuring are also found in the context of foreign privatizations.

1. Introduction

Conventional wisdom suggests that multinational companies are different from other firms. They tend to operate in industries where intangible assets, such as patents, new technologies and well established brand names, play an important role. In fact, they are responsible for most of the world's R&D expenditure (UNCTAD, 2005). They tend to be heavily involved in international trade and often establish production and distribution networks spanning multiple countries or even continents. And perhaps more importantly, multinationals outperform their competitors at home as well as in host countries in terms of productivity.

The differences in characteristics of foreign affiliates and indigenous firms have been documented in numerous econometric studies.[1] But is the superior performance of foreign affiliates due to the intrinsic advantages of a 'pushy' foreign parent company, or are foreign investors simply good at picking the best performing local plants as acquisition targets (the 'gifted kids' in our metaphor)? Recently, the application of sophisticated econometric techniques to longitudinal micro data has cast some doubt on an intuitive positive answer to the former question, often taken for granted by economists and policymakers.[2] As Harris and Robinson (2003) remark, if foreign ownership *per se* is not associated with a productivity advantage, "then it is difficult to see how foreign direct investment (FDI) can have a positive

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[1] Aitken and Harrison (1999) found that foreign affiliates exhibit a higher productivity than domestic plants in Venezuela, Javorcik (2004) and Sabirianova et al. (2005) found the same pattern in Lithuania and the Czech Republic, respectively. Yasar and Morrison Paul (2007) show that foreign affiliates differ from Turkish plants in terms of productivity, size and wages paid.

[2] Surveying the empirical literature, Barba Navaretti et al. (2004, Chapter 7.3) stress that much of the available empirical evidence "supports a statistical association between foreign ownership and productivity, but not a causal link." They further report that in those studies where a more careful analysis of causality was conducted "differences in productivity between the two groups of firms are smaller than in earlier estimations and often insignificant." See Section 2 for a review of the literature.

impact on overall (..) productivity and thus growth" in the host country. While the present analysis cannot provide an answer to the question of how foreign ownership affects firms that do not receive FDI, it is nonetheless hard to imagine positive spillover effects unless foreign ownership is beneficial to those plants that are directly affected.

The existing literature has focused mainly on the link between FDI and productivity neglecting the examination of other aspects of firm operations, which arguably are equally important. For instance, is there a causal relationship between foreign ownership and output growth, capital- and skill-intensity, reliance on export markets and imported inputs? If foreign ownership leads to a better performance, how does it happen? Is it related to restructuring, downsizing or lessening credit constraints?

This study analyzes a causal link between foreign ownership and different aspects of plant performance in Indonesia. Our analysis differs from the existing literature in three respects. First, rather than focusing on the narrow question of productivity, we consider a wider range of outcomes which can potentially be influenced by foreign owners. This allows us to understand what kind of changes are introduced (or not) by foreign owners and how they may translate into higher productivity. Second, we examine the implications of foreign ownership in two different contexts: foreign acquisitions and foreign privatizations.[3] Third, our analysis has an explicit focus on the direction of causality.

Disentangling correlation and causality in the context of foreign acquisitions and privatizations poses numerous challenges. If high productivity plants are chosen by foreign investors as acquisition targets, the ownership status becomes endogenous and a simple least-squares estimation invalid. This is why we use propensity score matching to assess the causal effect of foreign ownership on plant performance. The matching technique creates the missing counterfactual of an acquired plant had it remained under domestic ownership. It does so by pairing up each plant that will receive FDI in the future with a domestic plant with very similar observable characteristics operating in the same sector and year, where similarity is determined on the basis of those plant characteristics that have explanatory power in the acquisition decisions. Propensity score matching is then combined with a difference-in-differences approach. The causal effect of foreign ownership is hence inferred from the average divergence in the productivity paths between each acquired plant and its matched control plant, starting from the pre-acquisition year. This strategy allows us to control for observable and unobservable but constant differences between the acquired and the control plants. A similar challenge exists in the context of privatizations, and a similar solution is employed. Our difference-in-difference inferences on the matched sample comprise between 297 and 400 acquisition cases.

Our analysis, based on the plant-level data from the Census of Indonesian Manufacturing Plants, covering the period 1983–2001, shows that foreign ownership leads to significant and wide-ranging changes to plant operations and results in a higher total factor productivity (TFP) and a higher labor productivity. Our results suggest that the impact on productivity is a level rather than a growth effect.

Our analysis of acquisitions suggests that while better performing plants are more likely to be acquired by foreign interests, foreign ownership leads to a better performance in terms of TFP and labor productivity. The improvement is on the order of 13.5% for TFP and 63% for labor productivity. The productivity boost is achieved through restructuring involving an increase in the scale of production, hiring new labor, paying higher wages, massive investment in fixed assets, and in particular in machinery, and increased reliance on imported inputs and export markets.[4] Foreign ownership does not appear to affect capital- and skill-intensity. This suggests that new foreign owners may be introducing organizational and managerial changes that make the production process more efficient by reducing waste and using labor more effectively. Another possibility is that while foreign owners do not alter the skill composition of labor, they are able to attract the most experienced and motivated workers from local plants, which is in line with the observation that acquired plants hire a large number of new employees and raise the average wage. Yet another possibility is that the use of higher quality inputs or more suitable parts and components enhances productivity. This possibility is supported by the observation of FDI leading to a greater reliance on imported inputs. The positive effect of foreign ownership on plant TFP is found for acquisition targets which export while under foreign ownership as well as for those that do not do so. This gives us confidence that our findings cannot be attributed to higher mark-ups producers may enjoy in export markets. It also suggests that FDI induces changes that go much beyond the creation of new markets for the plant's products.

The results for foreign privatizations are broadly similar to those found in the context of foreign acquisitions. We find that foreign privatizations result in a better performance than domestic privatizations. Two years after the ownership change, foreign privatizations lead to a 27% TFP premium relative to domestic privatizations. The difference is even larger (54%) when labor productivity is considered. Foreign privatizations also result in higher output. In contrast to foreign acquisitions, foreign privatizations do not lead to higher employment. The lack of appetite of foreign owners for increasing employment may be due to the fact that publicly-owned companies are often overmanned. Where foreign owners do make a difference is the average wage and the skill composition of labor. Foreign ownership leads to an 8 percentage point higher share of skilled workers.

The remainder of the paper is structured as follows. The next section reviews the existing literature. Section 3 outlines our empirical strategy for identifying the causal relationship of foreign acquisitions, while Section 4 describes the Indonesian Census of Manufacturing. Section 5 explains the details of propensity score matching and the difference-in-differences technique. Section 6 presents the main results and a set of robustness checks. Section 7 focuses on foreign privatizations, and the final section concludes.

2. Existing literature

The existing literature focusing on the causal effects of foreign ownership on plant performance falls into two broad areas: studies examining the link between FDI and productivity and studies focusing on the implications for wages.

Starting with the former literature, the few studies examining the causal relationship between foreign ownership and firm performance have produced mixed conclusions. Harris and Robinson (2003) and Benfratello and Sembenelli (2006), using data from the UK and Italy, respectively, find that foreigners tend to acquire the best performing local firms and that foreign ownership does not lead in general to an improved performance of the acquired firm. In contrast, Conyon et al. (2002) conclude that acquisitions have a positive effect on the labor productivity of the acquisition targets in the UK. A similar conclusion is reached by Girma and Görg (2007a), who focus on food and

[3] In the working paper version of this paper (Arnold and Javorcik, 2009), we also look at the differences between greenfield FDI, domestic entrants and mature domestic producers. The results indicate that foreign-owned entrants outperform new domestic producers in terms of productivity, are larger, more capital- and skill-intensive, and more involved in international trade.

[4] Our results, pointing to profound changes taking place in FDI recipients, are consistent with anecdotal evidence (see Moran, 2001; Moran et al., 2005; Arnold and Javorcik, 2009).