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World Development Vol. 80, pp. 78–95, 2016

http://dx.doi.org/10.1016/j.worlddev.2015.11.001

Constructing a Ladder for Growth: Policy, Markets, and Industrial Upgrading in China

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Summary. — Indigenous firms in developing countries with large domestic markets have unique advantages: the low end provides "natural" protection from foreign competition, while higher-end segments provide incentives for foreign firms to localize activities and develop channels for future capability building. Paradoxically, in their eagerness to support development efforts of local firms, states often nullify these advantages and limit the opportunities and capabilities that local firms can leverage in the upgrading process. Using the case studies of three large industrial sectors in China that faced similar prospects but had widely different outcomes, this paper develops a framework for understanding how policy shapes the growth and segmentation of markets, and thus the opportunity for industrial upgrading of indigenous firms. The cases show how restrictive demand- and supply-side policies often inadvertently limited the opportunities for upgrading through their effect on the availability of know-how, inputs, and resources required for industrial upgrading (the supply side), and through their effect on the incentives for upgrading (the demand side). Given that each segment is a crucial rung on the development ladder, industrial upgrading efforts stall when state policy inadvertently knocks out rungs on the development ladder.

Key words — indigenous innovation, industrial upgrading, technology transfer, quality ladders, emerging markets, China

1. INTRODUCTION

Understanding the relationship between foreign and indigenous innovation in developing countries has long been a central focus of the development literature. The relationship is often portrayed as treacherous: states seek to draw on the knowledge and skills that can be gained from foreign firms, while at the same time aiming to avoid becoming overly dependent on them. [1] This has been particularly true in the context of export-led growth where foreign firms with advanced technologies have obvious advantages in selling to developed markets.

In recent years, scholars have asked whether emerging economies with large domestic markets might have special advantages in navigating the relationship with foreign firms because they are not as dependent on export markets (Brandt & Thun, 2010; Fu & Gong, 2011; Zhou, 2008). Within their home market, indigenous firms have more appropriate technology, products, and knowledge for the more price-sensitive low-end segments of the market, while foreign firms have an advantage in the high-end segments. Over time, the large and rapidly growing middle segments of the market provide incentives for both sets of firms to depart from their competitive strengths and to invest in the capabilities required to "fight for the middle" segments of the market (Brandt & Thun, 2010; see also Herrigel, Wittke, & Voskamp, 2013). Competing at home may offer opportunities that global markets do not.

Although a large domestic market provides potential opportunity for indigenous firms, there are no guarantees. China, for instance, has enjoyed productivity growth in manufacturing over the last 15 years that has been as high if not higher than rates observed in Japan, Taiwan, or Korea over similar periods in their development (Brandt, Von Biesebroeck, & Zhang, 2012); however, the role of indigenous Chinese firms within sectors varies widely. In some sectors domestic firms are rapidly becoming globally competitive and gaining market share while in others they continue to be dominated by foreign firms (Brandt & Thun, 2010). Similarly, in the case of Brazil, there are sectors where indigenous firms have benefited from the large domestic market (e.g., furniture and footwear, see Navas-Alemán, 2011) but there are also sectors where they have failed to do so (e.g., machine tools, see Alcorta, 2000).

In order to understand the dynamics of the increasing number of emerging economies that have both large-scale and rapid growth (Nadvi, 2014; Sinkovics, Yamin, Nadvi, & Zhang, 2014), it is necessary to shift attention from the traditional supply-side focus of an export-led growth model toward an understanding of how domestic demand in conjunction with local supply factors shapes the opportunities for indigenous firms. Just as a basketball team with several seven-footers is likely to employ different tactics than a team of more modestly sized players, a large emerging market has a range of policy options that smaller markets do not.

In this paper, we compare three Chinese manufacturing sectors—autos, heavy construction equipment, and motorcycles—that in principle offered similar opportunities for domestic firms to advance because technologies were relatively mature and domestic markets were huge and rapidly growing, but in only one of which have domestic firms succeeded. While Chinese construction equipment firms have rapidly narrowed the gap with multinationals in key market segments, huge differences persist in autos and motorcycles, and appear to be widening.

We argue that these outcomes are largely a product of differences in how state policy shapes the "fight for the middle"

* Loren Brandt would like to acknowledge the partial financial support of Canada's Social Sciences and Humanities Research Council and Eric Thun would like to acknowledge the partial financial support of the Leverhulme Trust. Neither funding body had any involvement in study design; in the collection, analysis, and interpretation of data; in the writing of the article; or in the decision to submit the article for publication. Eric Thun would also like to thank Mari Sako and Hiram Samel for comments on an earlier version of the article. Final revision accepted: November 5, 2015.

dynamic articulated in Brandt and Thun (2010). In a large emerging market, government policy influences the opportunities for upgrading not only through their effect on the availability of know-how, inputs, and resources required for industrial upgrading (the supply side) but also through their effect on the incentives for upgrading (the demand side). When growth in a developing country is export-led, the supply side is typically the crucial concern for policymakers, largely because the demand side is determined by global markets rather than national policy. With domestic-led growth, the two sides are equally important and highly complementary; moreover, policy choices made on one side of the equation often have unanticipated consequences on the other side. For example, policies used to mobilize resources on the supply side to help serve certain segments might inadvertently constrain domestic demand in other critical market segments; conversely, policies used to limit/boost demand in key market segments might limit the supply of firms, technology, inputs, and/or skills that are essential for future industrial upgrading.

Governments often take an active role in the development process, and the signs of an activist state can be found in each of our case studies. What is critical here is that policy makers should take care not to nullify the natural advantages that come with a large domestic market. A large, contested low-end segment, for example, can protect domestic firms as effectively as tariff protection and does not carry the difficulty of having to know when the infant industry stage has passed. Related, a large higher-end segment provides incentives for foreign firms to localize activities more effectively than allowed by stringent local content requirements, which are usually all too easily evaded. Given that each segment of the market plays a crucial role in the development process, our analysis suggests that the objective should be to implement "segment-neutral" policies that do not knock rungs out of the developmental ladder.

In the next section of the paper we use the concept of quality ladders to refine our view of how domestic Chinese and foreign firms compete, link this to the innovation and upgrading literature, and explain the relationship to policy. The third section is an explanation of our methodology. In each subsequent section, we show how policy influences the structure of the quality ladders in each sector, and how this related to the opportunities and/or constraints indigenous firms faced during the development process. As might be expected in sectors in which the upgrading process is largely incremental and unfolds over the course of decades, history matters: the roots of the differences between sectors lie in important policy choices in the 1980s and 1990s, the full consequences of which we see clearly today. A penultimate section extends the argument to cases of telecommunications and wind turbines. In the conclusion we return to the implications for policy.

2. CONSTRUCTING A LADDER

Our starting point is an examination of how firms from developing and developed economies compete. Differentiation on the basis of product quality plays a central role, a dynamic captured in the economics literature by the notion of quality ladders. [2]

In a product market, firms compete through vertical product differentiation, with each firm deciding the level of quality to supply on the basis of their own capability, input costs, and the price consumers are willing to pay for each level of quality (performance). [3] In this setting a ladder in quality emerges—higher rungs, higher quality, and higher prices—with firms producing the highest quality typically enjoying the highest profits. Because of better access to human resources, capital, and technology, richer countries have an advantage in producing higher-quality products, while lower labor costs provide poorer countries a competitive advantage in manufacturing lower-quality, less expensive versions of the same products. The length of the ladder in a product market will depend on the premium that consumers put on quality (Khandewal, 2010).

Our focus is on the ability of firms to produce and capture market share in successively more demanding and higher-quality product segments within a sector. Over time, movement up the quality ladder is critical for firms in developing countries in order to escape the intense competition characteristic of low-end markets where barriers to entry are low. [4] These pressures are compounded by the fact that success in lower-end product segments eventually leads to rising wages for firms, while rising incomes gradually reduce the demand for low-end products. In endogenous models of economic growth (Grossman & Helpman, 1991), firms with market power invest in R&D and innovative activity in order to move up the quality ladder and thereby escape the impact of competition lower down the ladder on firm profits.

Although there are instances when firms in a developing country might "leapfrog" those that came before, the development literature has long emphasized the importance of learning from earlier developers and making incremental changes and improvements to existing technologies in the context of relatively mature industries (Amsden, 1989; Amsden & Chu, 2003; Bernard & Ravenhill, 1995; Gerschenkron, 1962; Wade, 1990; Woo-Cumings, 1999). Innovation in this tradition is not the radical type that leads to new-to-the-world products, but is a process of gradual and relatively minor changes that cumulatively become important (Christensen & Rosenbloom, 1995; Dosi, 1982; Geroski, 2003; Henderson & Clark, 1990). This was the process by which firms in Japan (Womack, Jones, & Roos, 1990), Taiwan (Chen, 2009), and Korea (Amsden, 1989) moved into higher-value-added activities, and it has been identified as the dominant form of innovation in China (Breznitz & Murphree, 2011).

(a) *Export-led growth*

The starting point for much of the literature seeking to explain the successful cases of "catch-up" growth in East Asia is twofold: first, there is a large technological gap between local firms and global leaders; second, there is a gap in the knowledge local firms have about the export markets that they are targeting (Cimoli, Dosi, Nelson, & Stiglitz, 2006; Hobday, 1995; Schmitz, 2007).

In the developmental state literature, the primary focus is on how state policy enables firms to overcome constraints on the supply side. The state mobilizes resources, lowers the risk of investment, and selectively allocates resources to domestic firms that meet performance targets, usually in export markets (Amsden, 1989, 2001; Wade, 1990; Woo-Cumings, 1999). Promotion of licensing deals with foreign firms, public research institutes, and broader S&T policies open up channels of learning within the domestic economy. A core objective of this literature is to provide an explanation of why some states are able to develop the institutions that are able to take on an effective coordination role and others are not (Evans, 1995; Haggard, 2004; Kohli, 2004).