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Does intellectual property rights reform spur industrial development?☆

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ABSTRACT

An extensive theoretical literature generates ambiguous predictions concerning the effects of intellectual property rights (IPR) reform on industrial development. The impact depends on whether multinational enterprises (MNEs) expand production in reforming countries and the extent of decline in imitative activity. We examine the responses of U.S.-based MNEs and domestic industrial production to a set of intellectual property rights reforms in the 1980s and 1990s. Following reform, MNEs expand the scale of their activities. MNEs that make extensive use of intellectual property disproportionately increase their use of inputs. There is an overall expansion of industrial activity after reform, and highly disaggregated trade data indicate higher exports of new goods. These results suggest that the expansion of multinational activity more than offsets any decline in imitative activity.

1. Introduction

Do stronger intellectual property rights (IPR) spur industrial development? Over the last two and a half decades, policy makers have debated the benefits of IPR reform.[4] One of the central concerns raised in these debates is that stronger IPR would curtail the ability of local firms to imitate and build on the advanced technologies of foreign firms, potentially slowing economic progress. This was a common concern in the discussions of the 1995 Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) that required members of the World Trade Organization to comply with a set of minimum standards of IPR.[5] However, these costs could be partially offset by benefits that arise from increased investment and production by multinational enterprises (MNEs). Stronger IPR could induce MNEs to expand their scale of operations, manufacture technologically sophisticated goods, and quicken the rate of shifting production of existing goods to IPR-reforming countries. In this paper, we empirically assess the effects of stronger IPR on industrial development.

Our work is motivated by a rich theoretical literature on the global effects of IPR reform. Helpman (1993) develops several variants of a North–South general equilibrium product cycle model in which Northern innovation expands the range of differentiated goods produced in the world while Southern imitation leads to North–South production shifting. A robust finding of this analysis is that stronger IPR protection is never in the interest of the South. If stronger IPR in the

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[4] An excellent overview of the debate is provided in Maskus (2000).

[5] Another major area of concern focused on the high prices firms might be able to charge for patent-protected goods under strong IPR. The impact of IPR reform on prices and consumer welfare has been the focus of an extensive literature. See, for example, Maskus (2000), McCalman (2001), and Chaudhuri et al. (2006). In contrast, relatively little empirical work has focused on the potential impact of IPR reform on industrial development.

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South is treated as a reduction in the rate of Southern imitation and Northern firms are assumed to not shift production to the South through foreign direct investment (FDI), Southern IPR reform lowers the rate of Northern innovation and thereby limits the portfolio of products available globally. [6] If North–South FDI is permitted, a reduction in Southern imitation leads to more FDI but hurts the South because Northern multinationals charge higher prices than Southern imitators.

Lai (1998) extends Helpman (1993) to allow both the level of FDI and Northern innovation to respond endogenously to changes in the strength of Southern IPR protection, and this model is further extended in Branstetter et al. (2007), to the case where innovation, FDI, and imitation are all endogenously determined. In these extensions, unlike Helpman (1993), in any equilibrium with a positive rate of imitation, North–South FDI does not lead to factor price equalization. A lower wage in the South creates an incentive to move production of existing varieties there, but multinationals seeking to benefit from this incur a higher risk of imitation when they move production to the South. In Branstetter et al. (2007), as in Grossman and Helpman (1991a), imitation is a costly activity that requires a deliberate investment on the part of Southern firms seeking to copy Northern products. Stronger IPR protection in the South increases these costs, reducing imitation and lowering the risks faced by multinationals. Multinationals that move to the South employ the labor resources freed up by the decline in imitative activity. Production shifting allows for a reallocation of Northern resources towards innovative activity. Under certain parameter assumptions, a strengthening of Southern IPR protection enhances Southern industrial development because the increase in North–South FDI more than offsets the decrease in Southern imitation.

We test three hypotheses that follow from this theory. First, using detailed data on U.S. MNE activity, we seek to determine whether multinational firms respond to reforms by increasing production in reforming countries. Second, we use industry-level data to test whether growth in production by MNEs and local firms that are not engaging in imitation exceeds the decline in imitative activity. Finally, we look for evidence that the production of new goods shifts to reforming countries by analyzing initial export episodes that are identified in disaggregated U.S. trade statistics.

In our analyses, we focus on the effects of well-documented discrete changes in patent regimes over the 1980s and 1990s. We follow Branstetter et al. (2006), which assemble a set of substantive IPR reforms based on a number of primary and secondary sources. These are listed in Table 1.[7] Our approach of analyzing responses to well-defined IPR changes has the advantage that we may use fixed effects to control for features of the business environment in a country that are constant, that are hard to measure, that are correlated with the strength of IPR in the country cross-section, and that may affect firm behavior and industrial development in a manner similar to IPR.[8] We provide a more detailed discussion of these reforms below.

While we employ some of the same data as Branstetter et al. (2006), in this paper our goal is to formulate a broader assessment of the impact of IPR reform on the level and nature of industrial development in reforming countries, whereas this earlier work focused solely on technology transfers within U.S. multinationals. We find that U.S.-based multinationals expand the scale of their activities in reforming countries after IPR reform along multiple dimensions. Affiliates increase their assets, net property, plant and equipment (net PPE), employment compensation, transfer of technology from abroad, and research and development (R&D) expenditures. These increases are particularly large for firms that are especially likely to value reforms in the sense that they, prior to reforms, deploy high levels of technology abroad.[9] This evidence is consistent with U.S. multinationals shifting production of more technologically intensive goods to affiliates in response to reforms.

We further assess the impact of IPR reform on overall industrial activity. Our results indicate that industry-level value added increases after reforms and that this effect is concentrated in technology-intensive industries and in industries where MNE activity is concentrated. These findings suggest that declines in imitative local activity are offset by increases in the activity of multinationals and other firms that are not engaging in imitative activity. Although the theory described above stresses the direct role of changes in MNE activity, a large body of empirical work indicates that MNE expansion could generate indirect benefits for the host country by fostering the growth of local input suppliers, as in Javorcik (2004a), and by transferring advanced knowledge and skills to the local workforce, as in Poole (2009). IPR reform appears to lead to an overall enhancement of Southern industrial development.

We obtain further suggestive evidence on the rate at which production is transferred to reforming countries by analyzing disaggregated U.S. trade statistics. Following Feenstra and Rose (2000), we construct for each reforming country an annual count of initial export episodes, defined as the number of 10-digit commodities for which recorded U.S. imports from a given country exceed zero for the first time in our data. This measure increases sharply after IPR reform, suggesting that any decline in indigenous innovation is more than offset by an expanded range of goods being produced by MNEs and other firms. Again, the evidence suggests that IPR reform enhances, rather than retards, Southern industrial development.

The rest of the paper is organized as follows. Section 2 briefly discusses the sample of IPR reforms we study. Section 3 describes our data on U.S. multinational affiliates and parents and presents

Table 1
Timing of major patent reforms.

Country	Year of reform
Argentina	1996
Brazil	1997
Chile	1991
China	1993
Colombia	1994
Indonesia	1991
Japan	1987
Mexico	1991
Philippines	1997
Portugal	1992
South Korea	1987
Spain	1986
Taiwan	1986
Thailand	1992
Turkey	1995
Venezuela	1994

Notes: this table provides information about the timing of reforms in the countries that strengthen their intellectual property rights and are included in the sample.

[6] Glass and Saggi (2002) obtain a result similar to that of Helpman (1993). See also Markusen (2001).

[7] We include patent reforms in Japan in our sample even though it is a high income country, and it may not therefore be relevant to the models in which a Southern country reforms its IPR. Many students of the Japanese economy have pointed to the existence of a dual economy in Japan, with some industries achieving extremely high levels of productivity relative to the U.S. and other lagging far behind the U.S. productivity frontier. Given the substantial relative productivity lags that existed in some sectors, particularly at the beginning of our sample, we incorporate data from Japan in the empirical analyses described below. See McKinsey Global Institute (2000) and Porter et al. (2000) for discussions of these issues.

[8] While the 16 countries in our sample are quite heterogeneous in terms of their income, location, and industrial development at the time of reform, we recognize the need to exercise caution in extrapolating these results to countries outside the sample.

[9] The results on technology transfer and research and development expenditure are similar to those presented in Branstetter et al. (2006). We report them here to illustrate that, as the scale of MNE activity expands in IPR-reforming countries, it also becomes more technology-intensive.