

HEARING BEFORE THE  
UNITED STATES INTERNATIONAL TRADE COMMISSION

China: Intellectual Property Infringement, Indigenous Innovation Policies, and Frameworks for  
Measuring the Effects on the U.S. Economy

and

China: Effects of Intellectual Property Infringement and Indigenous Innovation Policies on the  
U.S. Economy

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TESTIMONY OF C. FRITZ FOLEY

Chairman Aranoff and Commissioners, it is my pleasure to participate in this very important and timely hearing. I am an Associate Professor at Harvard Business School and a Faculty Research Fellow at the National Bureau of Economic Research. In this testimony, I will describe how intellectual property infringement in China could affect the U.S. economy through three channels: international trade, cross border royalty flows, and foreign direct investment (FDI). I will draw heavily on the academic research on this topic; much of my own related work is joint with Lee Branstetter, Raymond Fisman, and Kamal Saggi. One conclusion that emerges from this body of research is that more stringent enforcement of intellectual property rights (IPR) would be likely to benefit not only the U.S. economy, but the Chinese economy as well.

My research analyzes the impact of major IPR reforms over the last 25 years, and I want to describe the techniques I use so that some estimates I describe later are clear. I study the experiences of countries that significantly reformed their IPR along a series of dimensions to expand the types of inventions that are eligible for protection, to expand patent scope and length, and to improve patent enforcement and administration. My work makes use of detailed Census data on U.S. trade, data on royalty flows and U.S. multinational firms collected by the Bureau of Economic Analysis, and industry-level data on industrial output. Studying reforms provides for

powerful tests of the impact of IPR because they allow one to analyze if changes in trade patterns, royalty flows, and FDI reflect the timing of IPR reforms. Cross-country studies that do not examine reforms but instead make use of proxies for the degree of IPR protection are usually subject to the concern that measures of IPR protection might capture other important country characteristics. Despite the benefits of studying reforms, I would like to urge caution in using the estimates I will describe below to infer the impact that stronger IPR in China would have. China has already initiated the process of IPR reform, and while it has further to go, considerable progress has been made. Therefore, the effects of reform might be smaller than they would be if China were building institutions to protect intellectual property from scratch. It is also not clear that the effects of strengthening IPR in one setting will be the same in another. The Chinese economy is very distinctive, and the effects of stronger IPR there could be as well.

How could patent infringement in China affect trade between the U.S. and China? First, local Chinese imitators could produce goods that are protected by IPR and that would otherwise be produced by U.S. firms. As a consequence, U.S. exports to China would be lower than they would be if Chinese IPR were stronger. Relatedly, U.S. exporters might choose not to sell innovative products to Chinese customers because of the concern that these products would be copied. Consistent with these stories, there is evidence that weak IPR in a country lowers U.S. exports to that country, although this effect is only operative for countries with the capacity to imitate, and it appears to be quite small.<sup>1</sup> Larger effects appear when one examines how IPR reforms affect the export of new goods to a reforming country—the number of initial export episodes increases by 28 percent around the time of reform.<sup>2</sup>

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<sup>1</sup> See Smith (1999).

<sup>2</sup> See Branstetter, Fisman, Foley, and Saggi (2009)

If Chinese imitators operated at a large enough scale, they could also produce goods and send them to the U.S. market. This activity might generate some benefits for U.S. consumers who would pay low prices for these U.S. imports, but it would displace the production of U.S. firms. Available data suggests that intellectual property infringement in China is not associated with significant levels of this kind of activity. The value of U.S. imports from China that were seized for reasons related to IPR violations in 2008 was only \$220 million, but total U.S. imports exceeded \$330 billion.

What about transfers of technology and the royalty flows that pay for such transfers? How does patent infringement in China affect these? To provide some sense of the magnitude of these flows, in 2008 total royalty and licensing fee receipts for the U.S. amounted to \$91.6 billion, and receipts from China were \$2.3 billion. These figures may seem small compared to total U.S. exports which were \$1.8 trillion, but these fees are likely to earn high margins for firms. They also represent a valuable source of earnings for the high technology sector in the U.S. When thinking about royalty flows, it is helpful to distinguish between two types, those that reflect technology transfers between arm's length parties and those that reflect transfers within firms. In arm's length transactions, it seems reasonable to assume that licensees from a particular country would pay less or not pay anything at all for access to technology if IPR was weak in that country. Foreign firms would also be fearful of transferring technology to an unaffiliated entity in that country because after the initial transfer this entity could stop paying fees but continue to use the technology. There is indeed academic evidence that arm's length technology transfers to countries with stronger IPR are larger.<sup>3</sup>

Weak IPR is also likely to deter the transfer of technology within firms. These transfers are particularly important; affiliated royalty payments make up roughly two-thirds of total U.S.

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<sup>3</sup> See Yang and Maskus (2001).

royalty receipts. When a firm transfers sensitive technology to an affiliate, it generally has to teach local personnel key elements of its technology, some of which may have been deliberately withheld from the firm's patents in order to prevent other parties from being able to copy its technology simply by reading patents. There is a risk that these employees will defect to a local manufacturer, taking with them and subsequently making use of sensitive technology. In a weak IPR environment, the multinational firm has little recourse. But if IPR is strong, firms can prevent the use of their technologies. My research indicates that stronger IPR is associated with larger transfers of technology and royalty flows within firms. According to my estimates, affiliated royalty payment receipts from affiliates in a country increase by about 8% following IPR reform in that country, and increases are much larger—more than 25%—for firms that tend to deploy technology abroad.<sup>4</sup> Therefore, stronger IPR in China would be likely to increase the amount that U.S. firms earn from transfers of technology. Given that U.S. multinationals perform more than 85% of their research and development in the U.S., increased returns to innovation would be likely to spur activity in the U.S.

The final channel by which intellectual property infringement in China could affect the U.S. economy is through foreign direct investment. In 2007, U.S. multinational affiliates had aggregate sales of \$5.5 trillion, and those located in China reported sales of \$146 billion. Understanding the effect of IPR on FDI is crucial for understanding the broader impact of IPR. Early theoretical work neglected to account for FDI effects and warned of harmful consequences of IPR reform for the global economy. According to this work, reform would reduce imitation. More production would take place in countries with strong IPR that tend to be more developed, and this production would employ resources that could be used to generate new innovations. As a result, levels of global growth and well being would be lower. However, these effects are

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<sup>4</sup> See Branstetter, Fisman, and Foley (2006) and Branstetter, Fisman, Foley, and Saggi (2009)

different if, in response to IPR reform, FDI allows production to continue to take place in countries with low labor costs and nascent innovation skills. FDI can facilitate production shifting and free up resources for innovative activity. The evidence in my research is consistent with this kind of an effect. U.S. MNE affiliate activity increases by 12-16% following reform, depending on the measure of activity used.<sup>5</sup> These increases are most pronounced among affiliates of firms that tend to deploy more technology abroad. Industry-level value added data indicate that the increase in activity by MNEs and other firms that are not engaging in imitative activity more than compensates for any decline in imitation. Thus, reform appears to spur industrial development in reforming countries. Stronger IPR could therefore benefit the Chinese economy.

But what effect does increased FDI have on the U.S. economy? One common concern is that increased activity by U.S. MNEs in places like China could come at the expense of activity in the U.S. Recent academic work does not suggest that this actually should not be much of a concern. There is evidence that the foreign and domestic activities of U.S. MNEs are, for the most part, complements and not substitutes.<sup>6</sup> Foreign expansion appears to fuel the demand for U.S. provided inputs and R&D. Thus, stronger IPR tends to benefit the U.S. economy through the FDI channel as well.

Thus far I have emphasized the perspective of U.S. firms. However, stronger IPR in China would also be likely to foster the development of Chinese innovators who will someday compete against U.S. firms to provide consumers all around the world with better and cheaper products. These firms would be likely to compete directly with U.S. firms and increase Chinese exports to the U.S., technology transfers from China to the U.S., and Chinese FDI in the U.S.

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<sup>5</sup> See Branstetter, Fisman, Foley, and Saggi (2009).

<sup>6</sup> See Desai, Foley, and Hines (2009) and Branstetter and Foley (2010).

To conclude, intellectual property infringement in China is likely to harm the U.S. economy through its effects on trade, royalty payments, and FDI. Although stronger IPR would require China to pay more for technologies developed in the U.S., there would likely be benefits for China to reform as well, notably those that accompany increased FDI in China.

I appreciate the opportunity to appear before you, and I am happy to answer any questions you may have.

## References

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