

How Does “Decoupling” Affect Firm Performance and Innovation in China and the U.S.?

This is the second SCCEI China Brief based on a recent paper from researchers at Columbia University, Peking University, and Cheung Kong Graduate School of Business that aims to measure the extent and implications of U.S.-China decoupling. The first brief can be found [here](#).

Is the divergence of tech ecosystems known as “decoupling” good for domestic firm performance in the U.S. and China? Do the consequences of technological decoupling differ for innovation and firm performance between the two countries?

It is possible that decoupling can hurt firm performance by reducing knowledge spillover and limiting access to foreign state-of-the-art technology. But it is also possible that decoupling can boost firm performance by allowing firms to create on their own while they are sheltered from competition. Researchers employed a unique analysis of firm characteristics and patent activity to determine if decoupling has helped or hurt the innovative capacity, productivity, and valuation of firms in the U.S. and China.

INSIGHTS

■ For China’s firms, increasing U.S.-China technology decoupling is associated with higher rates of patenting activity in the short term but lower firm productivity and valuation after two to three years.

■ For U.S. firms, there is no detectable relation between decoupling and innovation output or innovation quality. U.S. firms do experience a drop in valuation, though only half as large as the decrease incurred by China’s firms after decoupling.





■ For China’s firms, the negative longer-term impact of decoupling on productivity and valuation suggests that indigenous innovation incurs costs associated with “reinventing the wheel.”

The data. The researchers first established a measure of technology decoupling based on patent databases in the U.S. and China that included all publicly-listed firms that filed at least one patent between 2007 and 2019. If firms in either the U.S. or China increasingly cited domestic patents relative to foreign ones, they were understood to be pursuing their own technological trajectory, and therefore increasingly “decoupled” from the technology ecosystem of the other country.

Researchers then sought to determine the relationship between U.S.-China technology decoupling and four measures of firm performance: innovation output, innovation quality, total factor productivity (TFP), and firm valuation. Innovation output was measured by the number of patent applications a firm filed and received in one year. Innovation quality measured the relative citation strength of the patents, defined as the number of citations a firm’s patents received compared to other patents in comparable years and technology classes.

Decoupling for China’s firms: short-term benefits, long-term costs. Sectors marked by increasing U.S.-China technology decoupling were associated with significantly higher rates of indigenous innovation by China, as measured by domestic patenting outputs, in the same field one year later. But, this effect mostly disappeared after two years. The higher rates of domestic innovation were not associated with any decline in innovation quality. However, over a horizon of two to three years, heightened decoupling was also associated with lower firm productivity and valuation.

Does more “decoupling” incentivize local innovation and better domestic firm performance?

	One year after onset of decoupling		Two–three years after onset of decoupling		
Number of patent applications		no change	no change	no change	<i>Comparing outcomes for firms in the U.S. and China in decoupled sectors</i>
Relative citation strength of patents	no change	no change	no change	no change	
Firm total factor productivity (TFP)	no change	no change		no change	
Firm valuation	no change	no change			
	PRC firms	U.S. firms	PRC firms	U.S. firms	

Note: “no change” means no statistically significant change

DATA

- Data drawn from patent databases in the U.S. and China that include publicly-listed firms filing at least one patent between 2007 and 2019.

- Measures of firm performance include innovation output, innovation quality, total factor productivity, and firm valuation.

More specifically, researchers projected that a hypothetical increase in U.S.-China technology decoupling of 7.4%* is associated with a 13.1% increase in China’s firm patenting activity one year later, followed by a 2.1% drop in firm productivity and 5.2% decrease in firm valuation after two to three years

U.S. firms remain comparatively unscathed. In comparison, the effects of technology decoupling on U.S. firms were less pronounced. There was no detectable relation between increased decoupling and innovation output or innovation quality. Further, U.S. firms did not appear to suffer any productivity losses. U.S. firms did experience a statistically significant drop in firm valuation, though this drop in valuation was only half as large as the decrease incurred by China’s firms after decoupling.

One-sided implications of decoupling for innovation and firm performance.

While U.S.-China technology decoupling was associated with higher rates of innovation for China’s firms a year later, its firm productivity and valuation suffered over two to three years, suggesting that indigenous innovation incurs costs associated with “reinventing the wheel.” In contrast, the consequences of decoupling for U.S. firms were less obvious. This may be because U.S. firms are primarily at the world innovation frontier, so losing related technology from China inflicts little damage on their current productivity. Nonetheless, a dip in firm valuation suggests that stock markets believe decoupling does not benefit U.S. firms in the long run: perhaps because decoupling implies U.S. firms losing a large product market in China in addition to the losses due to reduced technology and talent exchanges.

The researchers also noted that for China, decoupling with the U.S. may be a proxy, perhaps to a lesser extent, for decoupling with the rest of the developed West. In contrast, bilateral decoupling likely does not mean the U.S. would decouple with other tech-important nations. Such an asymmetry may contribute to the more one-sided effect of decoupling on firm productivity and valuation in China compared to the U.S.

SOURCE PUBLICATION

Pengfei Han, Wei Jiang, and Danqing Mei (2022). **Mapping U.S.-China Technology Decoupling, Innovation, and Firm Performance.** SSRN working paper.

[VIEW SOURCE >](#)

* This number reflects the overall rate of observed technology integration between 2000 and 2019.