How Much Do China’s Joint Venture Requirements Promote Knowledge Transfers to Domestic Firms?


Until recently, China required foreign automobile companies to form joint ventures (JVs) in exchange for market access. Foreign ownership in these JVs was capped at 50%. The Office of the U.S. Trade Representative has criticized this policy as a means of forced technology transfer that unduly helped China’s auto firms upgrade at the expense of foreign firms. In a move widely viewed as a victory for foreign auto firms, China removed the joint ownership requirements in 2022. But how much of the quality upgrades induced by the presence of foreign auto firms occurred because of the JV requirements themselves?

**The data.** To document changes in automobile quality across metrics like fuel efficiency, rider safety, and engine performance, researchers use the annual Initial Quality Study (IQS) and Automotive Performance, Execution, and Layout Study conducted by J.D. Power between 2001 and 2014. Researchers then measured worker mobility using employment history data from LinkedIn and supplier networks using MarkLines’ Who Supplies Whom database to explore potential channels of knowledge spillover. The researchers supplemented their data with information on the geographic location of auto plants from firms’ official websites, patent information from China’s State Intellectual Property Office, and a household vehicle ownership survey conducted annually by China National Information Center.

**INSIGHTS**

- Dramatic quality upgrades in fuel efficiency, safety, and engine performance have been common across China’s auto industry since 2001.
- 8.7% of quality upgrades in a model made by a foreign joint venture (e.g., BMW-Brilliance) are transmitted to comparable models made by an affiliated domestic firm (e.g., Brilliance Auto).
- The flow of employees from joint ventures to domestic automakers and shared supplier networks are primary conduits of knowledge spillover from a JV to an affiliated domestic firm.

**Industry-wide quality improvement scores (by ownership type)**

![Graph showing quality improvement scores over time]

**Quality upgrading across China’s auto industry.** Researchers focused their analysis on three kinds of automobile firms in China: JVs, which include 23 partnerships between a foreign and domestic automaker (e.g., BMW–Brilliance); “affiliated” firms, which include 12 domestic automakers that are affiliated with a JV but that have independent production (e.g., Brilliance Auto); and “unaffiliated” firms, which include 7 domestic automakers with no JV affiliation at all (e.g., BYD).
Quality improvement due to knowledge spillover from ownership affiliation with a JV is only modestly (3.8–19.5%) larger than spillover from the simple presence of foreign automakers (2.8–12.7%).

While JV requirements aided the quality upgrading of China’s auto industry, removal of the requirements may not significantly hinder future knowledge spillover and quality improvement of domestic firms.

The researchers found evidence of quality upgrading across China’s automobile industry among all three firm types. For example, in 2003, the number of defects per 100 vehicles was 278 among JV models, 508 among models produced by affiliated firms, and 349 among models produced by unaffiliated firms. By 2014, however, the quality gap between all three firm types narrowed significantly: the number of defects per 100 vehicles was 94 among JV models, 123 among models from affiliated domestic firms, and 134 among those from unaffiliated automakers.

Knowledge spillover benefitted firms affiliated with a foreign JV. The researchers found that ownership affiliation with a JV (e.g., Brilliance Auto’s affiliation with BMW-Brilliance) enhanced knowledge spillover: 8.7% of the quality improvement observed in the JV model would be transmitted to the affiliated domestic models in the same vehicle segment. When a JV model scored one standard deviation higher on a quality dimension, the affiliated domestic automakers’ models scored 0.087 standard deviations higher on the same dimension than did models of other domestic automakers.

Researchers found that this knowledge spillover occurs through two main channels: worker flow and supplier overlaps. First, 27.2% of workers who switched jobs moved from a JV to an affiliated domestic firm, explaining up to 54% of the knowledge spillover. Knowledge spillover was particularly strong among high-tech workers like engineers and designers. Second, JVs and their affiliated domestic firms had greater supplier overlap than unaffiliated firm pairs and high-quality standards of JVs enhanced the performance of domestic parts suppliers. These factors explain up to 65% of the knowledge spillover.

Unaffiliated firms gain almost as much as firms affiliated with foreign JVs. When compared with car models of unaffiliated firms, researchers estimate the JV requirement improved the quality of affiliated models by 3.8–19.5% from 2007 and 2014 relative to unaffiliated models. Overall, while China’s JV policy did facilitate quality upgrading at affiliated firms, its impact is modest, relative to industry-wide spillovers and other demand and supply-side factors driving domestic upgrading.

Removal of JV requirements may not significantly curb knowledge spillover to China’s domestic firms. Though China’s government lifted the foreign ownership cap and JV requirements in the auto industry amid recent trade tensions with the U.S., this study’s findings indicate that the policy change may not significantly affect the quality upgrades of China’s domestic automakers. China still imposes JV requirements in other industries. The findings of this study suggest removal of these requirements alone may not significantly stem knowledge spillover to domestic firms.