SCCEI CHINA BRIEFS

SCCEI China Briefs are a product of the Stanford Center on China’s Economy and Institutions (SCCEI, pronounced “sky”). This recap highlights some of the most popular briefs of 2022 and groups them according to four important policy debates.

ASSESSING IMPORT COMPETITION FROM CHINA

The “China Shock” — or import competition from China — has adversely impacted swathes of the U.S. manufacturing sector over the past two decades, but also generated important gains for the U.S. and European economies that tend to be harder to measure.

What were the costs of the China shock? An analysis of United Nations and U.S. government data shows that import competition from China accounted for almost 60% of all U.S. manufacturing job losses from 2001 to 2019, mostly in labor-intensive manufacturing where fewer workers had college degrees. Laid-off workers rarely moved elsewhere and converted nearly one-for-one into long-term unemployment, causing a corresponding rise in government transfer receipts per capita that persisted even two decades beyond the initial trade shock. Despite lower consumer prices of goods imported from China, 6.3% of the U.S. population still experienced net losses in real income due to the China shock alone.

What were the benefits of the China shock? Alongside manufacturing job losses in the U.S. South and Midwest, analysis of U.S. census data shows that trade with China boosted employment in service sector jobs clustered in the West and East coasts where more workers had college degrees. The parallel trends constitute a “reallocation” of jobs, rather than a net loss of jobs.

Analysis of firm-level data from a dozen European countries and the U.K. shows that import competition from China produced a 14% rise in technological upgrading in Europe in the years following China’s entry into the World Trade Organization. The research concludes that gains to innovation and productivity across Europe may ultimately have outweighed the costs of trade competition with China.


ASSESSING THE IMPACT OF STATE SUPPORT FOR PRC FIRMS

State support has conferred significant advantages to PRC companies, not just in “sunset” industries from which the U.S. may be happy to retreat, but also in industries that both countries may be eager to lead.

The impact of state support for sectors targeted in Five-Year Plans. Analysis of data from millions of firms collected from the U.S. Census Bureau, an industrial database in China, and a private job posting platform shows that the sectors China has targeted and subsidized in its Five-Year Plans between 1998 and 2020 experienced a 15% surge in firm births, while corresponding sectors in the U.S. saw a 5% decline in both firm births and employment, as well as decreases in output and earnings. Displacement traditionally affected labor-intensive sectors in the U.S., but more recent displacement is occurring in capital-intensive sectors like transportation and telecommunications.

Has access to government data given China’s AI firms an innovation edge? Research into thousands of facial recognition firms in China shows that broad access to government surveillance imagery confers an innovation advantage for firms developing both government and commercial applications. PRC firms that received image-rich public security contracts from the government generated 52% more government software products and 20% more commercial software products over a period of three years after the contract than firms that received image-scarce contracts. Such access to government-collected data could shape the development of AI across a wide range of sectors, such as healthcare, education, and basic science.

Autocracy and innovation mutually reinforcing. A related analysis also shows that local incidences of unrest in China have led to increased state procurement of facial recognition AI. These investments are found to effectively deter subsequent unrest and spur more local government demand for facial recognition AI. This positive feedback loop allows for increased government procurement that both suppresses unrest and allows firms to innovate more quickly.

Number of firms in targeted sectors compared to non-targeted sectors around the release of a Five-Year Plan in China

Outcomes for U.S. firms in targeted sectors compared to non-targeted sectors around the release of a Five-Year Plan in China


China’s dependence on U.S. technology has declined sharply over the past decade, particularly in relatively newer technologies. But questions remain about whether PRC firms can innovate sustainably at the frontier in a decoupled world.

China’s reduced technology dependence since 2009. Analysis of PRC and U.S. patenting activity shows that China’s technological dependence on the U.S. rose throughout the decade approaching the Great Recession, peaked in 2009, and then began to decline as China developed its own R&D and innovative capacity. Of the sectors observed, China’s dependence on the U.S. is the greatest in pharmaceuticals, semiconductors, software, and smartphones, but their dependence levels have decreased over time. Most of the more decoupled fields are relatively new technologies, such as neural networks, cloud computing, and self-driving cars.

A mixed fate for PRC firms in decoupled sectors. 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.”

Innovation at the frontier? Analysis of patterns in U.S. and China patenting suggests that as China underwent economic expansion, its technology advancement relied heavily on adopting foreign, cutting-edge technologies, in particular those of the U.S. After a wave of learning and adoption, however, China’s technology dependence on the U.S. declined, as stronger domestic capabilities enabled a higher level of technology decoupling with the U.S. Yet, decoupling creates a barrier for companies in China to learn from their foreign counterparts, which hinders further progress and puts China at a disadvantage when more advanced technologies are developed. This zigzag process suggests a tension between China’s desire and its ability to progress independently.

HUMAN CAPITAL AND CHINA’S FUTURE GROWTH

Uneven progress in China’s education system could drag on future growth.

Analysis of education and employment trends suggest structural changes in China’s economy have created headwinds for hundreds of millions of low-skilled workers. According to official statistics, the fastest growing sector of China’s economy over the past decade is the low-skill, informal service sector. With employment in manufacturing and construction flat since 2013, nearly 60% of China’s non-agricultural workforce now works in the informal sector as gig-workers, delivery people, street hawks, and the like. Official statistics show that wage growth for this expanding part of the labor force had slowed, and has been outpaced by GDP growth, which itself is falling. During the pandemic era, real wages have fallen in absolute terms.

The link between excessive informality and undereducation. Upgrading lower-skilled workers so they can shift into higher-skilled work could curb excessive informality in the workforce. Unfortunately, analysis of China’s census data reveals that two-thirds of China’s labor force — roughly 500 million people — do not have a high school education. According to OECD data, this means China is the least educated country in the middle-income world. Low levels of education threaten to render large fractions of China’s low-skilled workers uncompetitive in a modern economy, leaving informal work the only option.

Are China’s investments in higher education paying off? To boost growth, China has invested heavily in university science, technology, engineering, and mathematics (STEM) education. A study analyzing the performance of thousands of electrical engineering and computer science students in a widely representative sample of U.S. and China universities shows that China’s freshmen outperform U.S. freshmen by a wide margin in STEM fields and score equally well in tests of critical thinking. However, upon graduation, China’s students experience declines in both STEM learning and critical thinking skills, while U.S. students make significant gains in critical thinking. This pattern calls into question whether China’s universities are equipping their students with the higher-level skills that are important for national competitiveness.

Employment trends in China: formal versus informal sectors (aggregate)

Employment trends in China: formal versus informal sectors (disaggregate)

