The Hamilton Index: Assessing National Performance in the Competition for Advanced Industries

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EXECUTIVE SUMMARY
Nations are in a fierce win-lose global competition for market share in advanced, traded-sector technology industries, because winning enables economic and national security. That is especially true for allied nations, because China’s gain comes at their loss and vice versa. Winning—not only the competition for innovation leadership but also for production capacity—will boost wages, international competitiveness, and economic and national security.

When it comes to the U.S. national interest, innovation-based production is key. The United States has a long history of pioneering innovations only to see their production captured by other nations, including China, which reduces growth, weakens the terms of trade (creating a higher trade balance and/or a weaker dollar), and degrades the national security industrial base.

ITIF’s Analysis and Findings
The Hamilton Center on Industrial Strategy at the Information Technology and Innovation Foundation (ITIF) examined national changes in global shares of output in seven industry sectors that the Center has aggregated into the Hamilton Index of Advanced-Technology Performance: pharmaceuticals; medicinal, chemical, and botanical products; electrical equipment; machinery and equipment; motor vehicle equipment; other transport equipment; computer, electronic, and optical products; and information technology and information services. This report covers three years—1995, 2006, and 2018—for 10 countries and regions: the United States, Canada, Mexico, Germany, the EU-28 minus Germany, China, India, Japan, Korea, and Taiwan.

The data show U.S. performance is weak and declining, both in absolute market share and relative to the size-adjusted global average (a ratio known as a location quotient). It is strongest in IT and other information services (software and Internet companies) and other transportation equipment (principally aerospace). In contrast, U.S. global market share in electrical equipment, machinery and equipment, and motor vehicles is quite low and falling. Significant growth in the IT and other information services sector, both globally and especially in the United States, is why the overall decline in U.S. global market share of advanced industries was limited to 1.5 percentage points from 1995 to 2018.

In relative terms, the U.S. pharmaceutical sector, along with other transportation, and IT and other information services, are all larger than the global average, while electrical equipment, machinery, motor vehicles, and computing and electronics are all below average (figure 1).
1995, advanced industries constituted about the same share of the U.S. economy as the global economy; by 2018, the share had fallen to 94 percent of the global average. In other words, the United States is less specialized than the rest of the world is in these advanced industries.

**Figure 1: U.S. performance in the advanced industry sectors comprising ITIF’s Hamilton Index**

Between 1995 and 2018, many countries’ global shares of advanced-industry output changed significantly (figure 2). As Japan’s overall share of the global economy fell, its share of advanced-industry output plummeted too, while China’s global market share increased by more than a factor of five. The U.S. share fell slightly.

**Figure 2: Global market shares of Hamilton Index sectors, 1995–2018**
In relative terms, most other nations held significantly higher shares of the global market in advanced industries than the United States: In 2018, China’s share was 34 percent above the global average, Japan was 43 percent higher, Germany 74 percent above the average, and South Korea and Taiwan were both more than twice the average. Interestingly, China’s relative share fell, especially after its 2009 peak, while Japan’s relative share stayed largely stable.

If U.S. policymakers want advanced industries to be the same share of the U.S. economy as they are in the rest of the world, advanced-industry output will have to expand by about $100 billion annually. To match China, output would have to expand by nearly $680 billion (42 percent).

**Figure 3: Total production and global market shares in Hamilton Index sectors, 2018**

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**Policy Recommendations**

To close these gaps, Congress should pass and fully fund the competitiveness legislation now on the table, including the provisions in the Senate bill regarding the National Science Foundation and the CHIPS Act. But as important as this legislation is, Congress will need to do more, if for no other reason than other countries, including China are doing more.

That is why Congress and the Biden administration should establish an economic “moon shot” initiative, committing the nation to increase its relative level of advanced-industry concentration by 20 percentage points in a decade.
Assuming a 3 percent growth rate in the rest of the economy, doing so could add nearly $2.5 trillion to advanced-industry output over 10 years. It would also reduce U.S. supply chain vulnerability, create millions of good jobs, reduce the trade deficit, weaken China’s advanced economy, and shore up dual-use industries critical to U.S. national defense.

To help achieve all of this, Congress should pass and fund a $25 billion annual “Super CHIPS Act”—a federal incentive program (to be matched by state and local governments) that provides financial incentives for U.S. and allied-country firms to build or expand advanced-industry R&D and production sites in the United States.

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