

**CITD Nerding Out:**  
**Can Industrial Policy Fix Supply Chain Issues and Make the US  
More Competitive?**



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WES WATKINS CENTER FOR  
**INTERNATIONAL  
TRADE DEVELOPMENT**  
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## **WHAT IS NERDING OUT?**

The reports that the CITD produces typically seek to treat trade and competitiveness related topics in a way that combines accessibility with academic rigor. We created the “CITD Nerding Out” as a format which allows us to take an even deeper dive into social science theories and the use of more complex statistical tools. These briefs will still address topics of relevance to trade and competitiveness. Let us know what you think!

## INTRODUCTION

The COVID-19 pandemic greatly disrupted the global supply chain. These disturbances included nationwide lockdowns on the movement of people and factory shutdowns. These shocks effectively broke an already strained, fragile supply chain.<sup>1</sup> This pandemic-caused supply disruption raised concerns in the US about how dependent on China its supply chain has become and has renewed calls for an industrial policy (IP). In response to this pressure and other political motivations, the US Congress passed the United States Innovation and Competition Act of 2021 (USICA) legislation with the purpose of proving alternatives to supply chains dependent on Chinese microchips by fostering their manufacture in the US. The bill was marketed as a necessary move in order to protect US national security.<sup>i</sup> The bill allots \$250 billion to boost scientific research, develop of artificial intelligence and space sciences, and to increase the production of semiconductors within the United States.<sup>ii</sup> Specifically, \$80 billion is being directed into robotics, biotechnology, and artificial intelligence research; \$1.5 billion to 5G/6G technology innovation; \$23 billion to space exploration; and \$10 billion in developing technology hubs outside of Silicon Valley. The bill also targets China with \$1.5 billion to be allocated to a “Countering Chinese Influence Fund”, updated sanctions towards Chinese officials, prohibition of Chinese apps on federal devices, and more.<sup>iii</sup>

This bill represents a top-down IP, as it focused on specific industries in which policymakers would like to see increased in efficiency and output. However, top-down approaches to increasing an industry’s competitiveness are rarely successful and do not lead to profitability. Here, at the Center for International Trade Development (CITD), we care about US competitiveness, especially Oklahoma’s competitiveness. Therefore, we have produced this brief to provide a primer on IP for a general audience, investigate IP spending in the US, and discuss alternatives as well as when top-down IP might be appropriate. In the next section we discuss the background of and theoretical justification for IP. Then, we discuss the results of an analysis that used tax credits as a proxy for top-down IP spending, which found no correlation between spending and changes in an industry’s competitiveness. In the final section we discuss the alternative of bottom-up IP spending, which focuses spending on inputs instead of specific industries. Bottom-up IP can promote dynamic development without choosing winners and losers by investing in public goods such as infrastructure and human capital, making it less susceptible to inefficient rent-seeking and dependency on government spending.

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<sup>1</sup> Part of the reason the supply chain is so fragile is that it had been built on the global institutional norm of “Just in Time”. For more information on what this means and a more detailed discussion, see the CITD brief, “Supply Chain Chaos: Any End in Sight?” <https://global.okstate.edu/partnerships/citd/supplychainchaosfinal.pdf>

## **BACKGROUND ON INDUSTRIAL POLICY**

IP can be defined as “any type of selective government intervention or policy that attempts to alter the structure of production in favor of sectors that are expected to offer better prospects for economic growth in a way that would not occur in the absence of such intervention in the market equilibrium.”<sup>iv</sup> Arguments for IP have a long history, derived from infant industry policy (IIP) arguments from prominent thinkers such as Alexander Hamilton and Fredrich List. However, even in these authors’ works, and orthodox economists’ modern iterations of IIP, it is reserved for developing economies, not highly developed countries like the United States, and is prescribed as a temporary measure. In the late 18th century, the argument was that economies like Germany and the US that had not yet industrialized would never do so if they engaged in free trade. This was because the upfront costs made industrialization unattractive to investors and importing from industrialized nations (the UK) was cheaper in the short and even medium term. This market failure meant these economies would forever remain a provider of raw materials and thus never develop. The assumption behind IPP was that after the policy creates a profitable and self-sufficient industry, protection (via subsidies or even less efficient, but cheaper to implement tariffs) should be removed. The primary point of contention for IIP is that the government has an ability to identify market conditions for a profitable industry that the capital market does not.

Throughout American history, the US government has implemented industrial policies numerous times. Abraham Lincoln utilized industrial policy by implementing high tariffs to preserve certain markets and industries. This policy, which became known as “The American System,” would lead to the creation of the American railroad system. Franklin D. Roosevelt’s “New Deal” of the 1940s, which regulated wages and prices among various industries and mobilized the American economy into a wartime production economy was also an example of IP in the US. Recent examples of IP in the US are the 2002 tariffs on steel imports signed by then President George W. Bush. The tariffs were later rescinded as thousands of downstream steel-using industries became uncompetitive and laid off thousands of employees, while only modestly boosting local employment for steel factories.<sup>v</sup>

Despite a record of mixed results and unclear causality, IP is defended by some modern economists as a necessary practice to address market failures. The market failures they point to generally fall into the categories of knowledge spillovers, economies of scale, coordination failures, and information externalities. Knowledge spillovers occur when the development of expertise in one industry can spur the development of other. For example, the competencies the US developed during the space race allowed it to be a leader in the tech industry. Economies of scale refer to the fact that as production increases, per unit costs usually fall due to fixed costs making up a lower percentage of input for many goods. If large economies of scale are required for profitability, investors may not want to wait for the ROI. Coordination failures occur when simultaneous investments that combine both upstream and downstream investments, are required.

Information externalities occur when the private sector lacks government knowledge and vice versa. However, history shows that once protection of an industry is granted, whether through tariffs or subsidies, it is exceedingly difficult to remove. We see this in industries like sugar or the automotive industry in the US. Despite being large, they still receive substantial government funding and any attempt to remove it is met by fierce opposition. Top-down industrial policies also lend themselves to zero-sum economic competition thinking in the global market, which can escalate into a broader trade policy conflict.

A less economic focused rationale for IP is national security. A prominent feature of this discussion is the potential threat of China, which is undoubtedly implementing industrial policy. Because China is thought to desire to reshape the international order in ways that would not benefit US interests, some argue that in order to keep a competitive edge over China, both economically and militarily, the US and other Western nations also need to implement industrial policies. This approach played out in the Trump administration's trade policies, which included punitive tariffs on roughly \$550 billions of Chinese-made goods along with accusations of unfair commercial practices.<sup>vi</sup> This instigated a trade war, as China responded with tariffs on over \$185 billion on US exports.<sup>vii</sup> There is also concern regarding China's use of banks and equity to help subsidize certain strategic industries, especially in technology sectors.<sup>viii</sup> Another source of concern is China's requirement that foreign firms must enter into joint ventures with domestic Chinese firms to gain access to certain markets.<sup>ix</sup> This is seen as a ploy for Chinese firms to forcefully acquire new technology from their foreign partners.<sup>x</sup><sup>xi</sup>

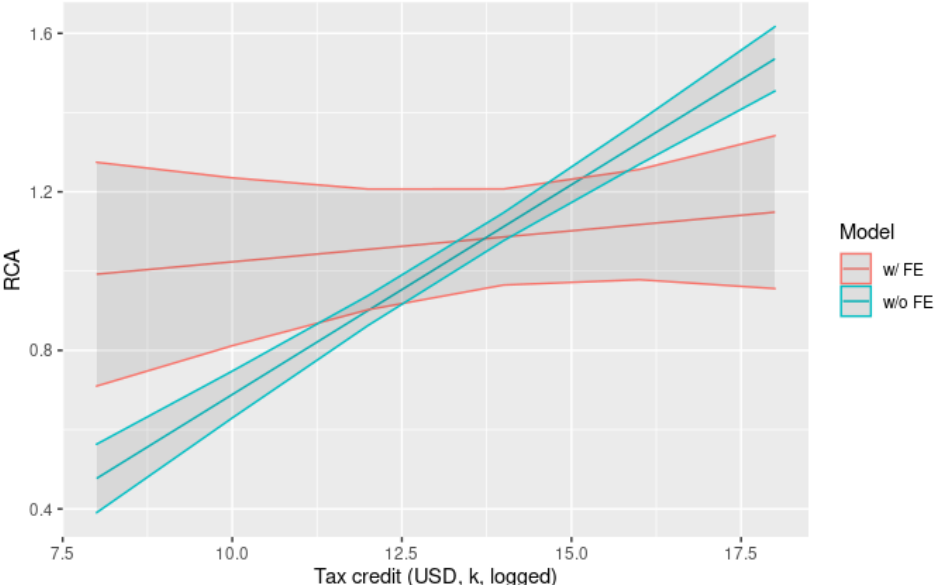
In the next section we will discuss our results from using tax credits as a proxy for top-down IP spending to investigate whether top-down IP has showed any signs of success and is thus a policy path warranted by the increase of an industry's global competitiveness.

## **ANALYSIS**

Given the highly conditional theoretical justification for IP and the many documented failures, we set out to investigate whether recent US government spending has contributed to changes in US industry competitiveness. To conduct our investigation, we looked at the relationship between US tax credits by industry and changes in the industry's revealed comparative advantage. We used tax credits because data was not available for increasing direct assistance by industry and tax credits represent a relatively strong proxy for measuring direct industry support. Revealed comparative advantage is a standard method in the economics literature used to test how competitive an industry is by looking at how much a country exports in a particular good relative to the total amount of the good that is exported in the entire trade market. If tax

credits were useful in contributing to an industry’s competitiveness, making the industrial policy justified, we would expect a positive relationship between the two.<sup>2</sup>

To test the strength of the relationship we look at visual representations and conduct linear regression analysis. Using regression analysis, we find that when no controls are applied in the model, there is a positive and statistically significant relationship between application of tax credits and an increase in Revealed Comparative Advantage (see Figure 1, green plot, w/oFE). However, when we apply a technique known as fixed effects (FE) to hold time and industry constant, there is no longer a correlative relationship between tax credits and industry competitiveness. The model where FE is applied has a much higher overall model fit (about double) and is generally regarded in econometrics as the better method to discern a relationship between variables when there are multiple units of analysis and time periods in the sample.



**Figure 1: Predicted Values using regression with 95% confidence intervals**

### IMPLICATIONS

The US is undoubtedly facing major economic and geopolitical challenges to its supply chain and to maintaining its competitiveness in global markets. However, the proposed top-down industrial policy approach will not be an effective long-term solution. There is compelling evidence in the economic literature and our analysis that increasing government spending for a specifically selected sector will not

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<sup>2</sup> For a more in-depth discussion of the analysis design, data sources, and results, please see our online “Nerding Out - Industrial Policy Appendix and Further Reading (<https://global.okstate.edu/partnerships/citd/nerdingoutappendix.pdf>).

lead to competitiveness for the US economy. Instead, top-down IP is likely to produce industries dependent on government assistance with no incentives to increase efficiency.

The likely result of a top-down IP does not mean that government policy cannot play a positive role in long-term development. Instead, the US should consider prioritizing a bottom-up industrial policy and at times, short-term, targeted top-down approaches. As mentioned earlier, bottom-up IP refers to investment in public goods such as education, healthcare, and science. Public goods are non-excludable and therefore every firm and industry can benefit from them. This means that bottom-up IP focuses on developing inputs to economic activity instead of selecting industries to invest in, which still allows market forces to incentivize maturation of competitive industries, thus promoting dynamic, long-term development.<sup>3</sup>

For top-down policy considerations, we recognize that there are certain instances, like the Manhattan project for example, or in more recent history rare earth metal dependence, where top-down approaches can be a legitimate choice for a government because profitability is less important than other concerns. However, there must be built in checks or termination parameters so that government support can be gradually removed if the industry being funded eventually needs to become profitable. Policymakers should be fully aware of the fact that when using top-down approaches, economy wide profitability will likely not be immediately realized nor incentivized, even if they contribute to another industry's profitability through spill-over effects.

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<sup>3</sup> For a more detailed explanation of bottom-up IP and how that might be implemented in Oklahoma see the CITD's brief, "The Human Equation: How competitiveness and human capital development intersect in Oklahoma" ([https://global.okstate.edu/partnerships/citd/citd\\_human\\_equation\\_report.pdf](https://global.okstate.edu/partnerships/citd/citd_human_equation_report.pdf)).

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<sup>iii</sup> Ibid

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<sup>vii</sup> Ibid

<sup>viii</sup> Ibid

<sup>ix</sup> Ibid

<sup>x</sup> Ibid