Article

Are U.S. Export Controls an Effective Policy for Innovation?

Marta Grzana[1]

[1] Student (BSc Management, 2022-25), Dept. of Management, LSE, UK; m.h.grzana@lse.ac.uk

How to cite
Grzana, M. (2025). Are U.S. Export Controls an Effective Policy for Innovation? *UCL Journal of Economics*, vol. 4 no. 1. DOI: 10.14324/111.444.2755-0877.2018

Peer review
This article has been peer-reviewed through the journal's standard double-blind peer review, where both the reviewers and authors are anonymised during review

Abstract
Who bears the predominant cost of U.S. semiconductor export controls? Using CPI and import price data, and a difference-in-differences design, our results suggest that it is the U.S. government. The findings suggest that the combined complementary U.S. semiconductor policies, comprised of the export controls and the CHIPS and Science Act decreased the price paid by customers for semiconductor-based electronics by 12.3%, yet increased the import price of semiconductors by 8.3%. The paper adapts theoretical frameworks by Mazzucato and Atkinson & Ezell to evaluate how policymakers can shape innovation markets through positive and negative measures. Moreover, we evaluate export controls as an innovation policy and their effects on domestic and foreign innovation processes. The findings suggest that there should be greater consideration of foreign policy reactions in shaping innovation policy.

Keywords: Trade, Imports, Export Controls, Semiconductor

1. Introduction

In this paper, we investigate how public policy affects innovation through examining the domestic effect of U.S. semiconductor export controls imposed on October 7th, 2022. Export controls are a policy tool that allows a country to control the export of specified goods. It prevents domestic businesses from exporting goods listed by the government. The first move towards implementing the tool was the 2018 bipartisan Export Control Reform Act which was spurred by growing concern over U.S. economic security due to the rise of China (Bown 2019, p. 285). In June of 2021, the White House published a set of reports based on the 100-day supply chain reviews requested in the Biden Administration's Executive Order 14017, which made several policy recommendations, including that export controls on semiconductor-related equipment and technology could protect American technological advantage, and limit the development of advanced semiconductor capabilities in countries of concern.

Following these reports, on September 24th, 2021, the Bureau of Industry and Security published a Notice of Request for Public Comments on Risks in the Semiconductor Supply Chain. Additionally, on September 29th, 2021, the White House released the U.S.-EU Trade and Technology Council Inaugural Joint Statement, following the Council's meeting in Pittsburgh, which outlined the commitment to identify gaps, vulnerabilities, and oppportunities along the semiconductor supply chain in order to strengthen semiconductor R&D and manufacturing. Furthermore, on October 29th, 2021, the BIS held the Virtual Forum for Risks in the Information Communication Technology Supply Chain (Shin et al., 2021). Over the course of the of the following months, several legislators advocated for implementing export controls on semiconductors, and adjacent policies (Tausche & Macias, 2021).

Finally, in August of 2022, President Biden signed the Creating Helpful Incentives to Produce Semiconductors (CHIPS) and Science Act, appropriating $52.7 billion for investment in the U.S. semiconductor industry. Finally, in October 2022, the U.S. enacted a set of export controls on advanced semiconductors and semiconductor manufacturing equipment for making chips smaller than 14 nanometers, which restrict U.S. companies from exporting such technology to China (Gupta, Borges, and Palazzi 2024).

Before 2022, American semiconductor policy was mainly market-driven, and export controls had not been used in over 50 years (Benson 2023). However, modern export controls target the most important technology of our decade; advanced semiconductors are key for developing new cutting-edge innovations, such as artificial intelligence (Gupta, Borges, and Palazzi 2024). Extant literature is limited and primarily looks at export controls as a foreign policy tool. This paper contextualises export controls and analyses them as a platform for innovation management. By definition, export controls restrict the natural flow of ideas and innovation processes with the purpose of protecting domestic intellectual property and boosting the domestic economy. They are a powerful new tool, and thus it is important to know what real effects they are bound to have on innovation.

The paper examines how the October 2022 policy affects the price of imported semiconductors paid by U.S. manufacturers, and the price of electronic devices paid by customers through a difference-in-differences quantitative research design. We attempt to answer the following question: Who bears the predominant cost of U.S. semiconductor export controls? The paper investigates the effect of export controls on domestic prices to determine who their cost get passed onto - foreign countries, domestic businesses, customers, or the government itself? Finally, we evaluate whether export controls are an effective or harmful policy from an innovation standpoint.

The paper argues that export controls on semiconductors imposed by the U.S. in October 2022 resulted in China retaliating with similar measures which led to an increase in semiconductor prices due to (1) higher prices of Chinese semiconductors or (2) the need to switch to more expensive domestically produced parts. Despite this, we find that higher prices were not passed along to the customer which we argue to possibly be the result of government intervention and subsidies through domestic innovation policy (the CHIPS Act) – in which case the final cost is passed on to the government.

2. Literature Review

There is a great deal of literature on the link between public policy and innovation. Ludvall (2007) argues for a systemic approach to innovation policy. Instead of solely analysing inputs and outputs, it is crucial to gain an understanding of the linkages within an overall national innovation system. He argues that the flow of technology and information is key to the innovation process, and analysing innovation systems holistically can allow policymakers to identify leverage points for

https://doi.org/10.14324/111.444.2755-0877.2018

improving innovative performance. He frames the role of policy as a tool to address systemic failures that have the potential to impede innovation. Ludvall also acknowledges that with the rise of globalisation, firms increasingly rely on innovations developed abroad. Yet, he notes that the relationship between international knowledge and national innovative capacity has not been established in a systematic way (Lundvall 2007).

Mazzucato (2017) builds on the notion of cohesive, system-wide policy by introducing the concept of mission-oriented innovation policy, policy that focuses on creating system-wide transformation across sectors. Such policy has a clear mission; it is not only concerned with the rate of economic growth but also its direction. This notion goes against neoclassical economic theory which justifies government intervention only if there are explicit market failures, and against Ludvall's view of the role of policymakers in innovation which is to address systemic failures. A mission-oriented innovation policy is responsible for actively shaping and creating systems and markets for innovation, not just fixing market and system failures (Mazzucato 2017).

Here, I introduce a simple typology for understanding types of innovation policy: they can be positive or negative. Mazzucato's concept of innovation policy frames the desired policies as open and encouraging: positive. Nevertheless, innovation policy can also be closed and discouraging: negative. Negative policies fall under a mercantilist or innovation mercantilist approach, a term introduced by Atkinson & Ezell (2012). Mercantilist innovation policy seeks to realise innovation-driven growth through affecting global trade in a way that boosts the mercantilist's exports and reduces imports. This approach attempts to draw foreign technology and innovation activity to the mercantilist (Atkinson 2012, p. 191). Examples of mercantilist policies include high tariffs, non-tariff barriers to trade, and export controls. Mercantilist policies can also be the lack of a policy: lack of patent enforcement, allowing for systematic intellectual property theft and forced technology transfers. Mercantilism goes against classic liberal trade theory which says that free trade is a positive-sum game that maximises international economic welfare by allowing customers access to the highest value and lowest cost goods and services worldwide (Ricardo 2005, p. 150). Yet, that effect only holds if countries implement solely positive innovation policies. In reality, countries aim to gain an unfair advantage through mercantilist measures. The more countries adopt mercantilist practices, the more it pays off for new nations to adopt them. By far, the country that has put such measures to practice to the largest extent is China (Atkinson 2012, p. 192).

Historically, China has been at the forefront of innovation; its invention of cast iron, paper, and the compass well pre-dated the West. However, innovation stagnated after the fourteenth century. Presently, China wants to re-establish itself at the forefront of innovation in order to solve problems caused by rapid economic growth and increase the international competitiveness of Chinese businesses. China's innovation model is rooted in the imitation of existing technology and the exploitation of lower production costs, selling imitated products cheaper, and gaining economies of scale (Yip and McKern 2016, p. 13). Additionally, China practices incentivised (forced) technology transfers where foreign companies trade technology in return for market access or lose out to competitors. China loosely enforces the Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement, a WTO agreement that binds members to honour patents (Atkinson 2012, p. 209). Thus, the U.S. decision to use export controls, a mercantilist practice, in response to Chinese mercantilism does not go unjustified (Bateman 2022).

Nevertheless, there are drawbacks to using a negative innovation policy. The New York Federal Reserve Bank found that after October 2022, the companies by export controls recorded a significant drop in revenue and employment, partly as a result of lost access to Chinese markets. The report also found a chilling effect on business relationships with Chinese companies not affected by the export controls. Such loss of revenue undermines the economies of scale that the semiconductor industry depends on and diminishes the competitiveness of U.S. businesses (Crosignani et al. 2024). Moreover, due to the unilateral pursuit of the policy, Netherlands and Japan-based companies were able to sell record quantities of their chip-making equipment to China until they conformed to apply similar export control policies. This hurt U.S. businesses in the short-term without affecting the target state (Schleich and Denamiel 2024). China reacted in two main ways. Firstly, the country retaliated against U.S. companies by blocking them from selling certain types of chips and planned mergers. Secondly, China reinforced its innovation agenda through state-led investments into the domestic semiconductor industry. By extension, the export controls incentivised Chinese companies to innovate independently since they could not rely on U.S. technology transfers (Gupta, Borges, and Palazzi 2024).

https://doi.org/10.14324/111.444.2755-0877.2018

3. Theoretical Framework

The paper investigates who bears the predominant cost of U.S. semiconductor export controls and evaluate the effectiveness of the policy as a tool of innovation management through applying the following theoretical framework. Drawing from Mazzucato (2017), export controls can be framed as a mission-oriented innovation policy. They do more than just fix market failures, they have a clear direction, and they foster markets for innovation within their economies by limiting the spread of technological innovation to competitors. Yet, by definition, they are a negative measure that restricts the flow of knowledge and ideas. Mission-oriented innovation policy theory, similarly to the theory of national innovation systems, fails to account for the importance of foreign innovation policy in light of the rise in globalisation. The theories do not consider variation in the agendas of states partaking in international trade. I augment the theory by adding a way in which governments can shape markets for innovation through protectionist measures: innovation mercantilism. A mission-oriented innovation policy can also be the use of tariffs, export controls, and other protectionist measures to promote domestic innovation industries. Countries can manipulate access to their markets in order to prevent IP theft while propping up domestic industries through investment. I stress that mercantilism is not optimal in an ideal setting of international relations yet may be justified for economic and national security.

Thus, the theoretical framework builds on Mazzucato's theory of mission-oriented innovation policy and completes it with Atkinson & Ezell's innovation mercantilism. Thus we can evaluate the effect of U.S. semiconductor export controls as a mission-oriented and mercantilist innovation policy. We apply this framework through empirical analysis of the effect of the intervention on semiconductor import prices and the retail prices of consumer electronics to find that export controls shape the domestic market. Moreover, this framework is limited because due to the international nature of innovation processes, export controls indirectly shape and create foreign markets for innovation. U.S. innovation policy affects Chinese innovation policy, prompting China to react with larger domestic subsidies, and incentivising Chinese businesses to innovate on their own. Additionally, alignment with countries, such as the Netherlands and Japan, means that U.S. innovation policy shapes Japanese and Dutch innovation policy. Therefore, due to the global nature of innovation, it is vital to consider the international effect of national innovation policies. In cases when countries are not in alignment and use mercantilist measures, an optimal mission-oriented innovation policy may be a mercantilist response (Steinberg 2023).

4. Empirical Analysis

4.1. Data

The paper tests the framework through quantitative empirical analysis. We use data from the U.S. Bureau of Labour Statistics between 2018 and 2024. Specifically, we use data on import prices for semiconductors, and televisions and video receivers for the first stage of my analysis (Bureau of Labor Statistics 2025a). For the second stage, we use the consumer price index (CPI) for computers, peripherals, and smart home assistants, and the rest of the CPI basket to create a synthetic contrcrool unit (Bureau of Labor Statistics 2025b). This is monthly, time-series data on the price of each good.

4.2. Design

The research design has two stages. In each stage, we use a difference-in-differences empirical design, given that we are conducting an event study analysis. The first stage determines the effect of the October 2022 semiconductor export controls on the domestic consumer prices of semiconductor-based devices. From this analysis, we infer the effect of the policy on the domestic innovation market, and whether its cost was passed onto the customer. For the second stage, we measure the effect of the policy on the import prices of semiconductors into the United States. From this, we infer whether and how the policy affected foreign innovation markets and American businesses.

The paper employs a difference-in-differences approach to measure the effect of the October 2022 semiconductor export controls. The treatment takes place on October 7th, 2022, and represents the imposition of export controls. However, we can observe a treatment effect starting in September 2021, which is when the Biden administration made several annoucements, suggesting the intent of the policy. This could lead to U.S. businesses reorganising their supply chains in anticipation of the export controls implementation. To address this issue in the study design, I test both the October 2022 policy implementation date and the intent of policy annoucement date a year earlier as treatment dates. Moreover, when measuring the effect of the policy on domestic consumer prices of computers, we interpret the results as the combined effects of the export controls implementation and the August 2022 CHIPS Act domestic subsidies for the semiconductor industry.

https://doi.org/10.14324/111.444.2755-0877.2018

In the first stage, I use the CPI for semiconductor-based devices as the treated unit, and then design a synthetic control unit with the remaining goods in the CPI basket, using the method pioneered by Abadie et al. (2010). The method approxiates the control unit, using a selection of donor goods. Each donor good is weighted in such a way that the weighted average of the donor goods approximates a sufficient synthetic control unit which feature parallel trends with the treated unit, pre-treatment.

The regression equation for the analysis is as follows, where the dependent variable is the CPI for computers, Post is a dummy variable that takes the value of one if the observation takes place after the treatment date, and Treat is a dummy variable corresponding to whether the unit is treated, or whether it is the synthetic control.

$$\text{Computers CPI} = \alpha + \beta_1 \text{Post} + \beta_2 \text{Treat} + \tau(\text{Post} \times \text{Treat}) + \varepsilon$$

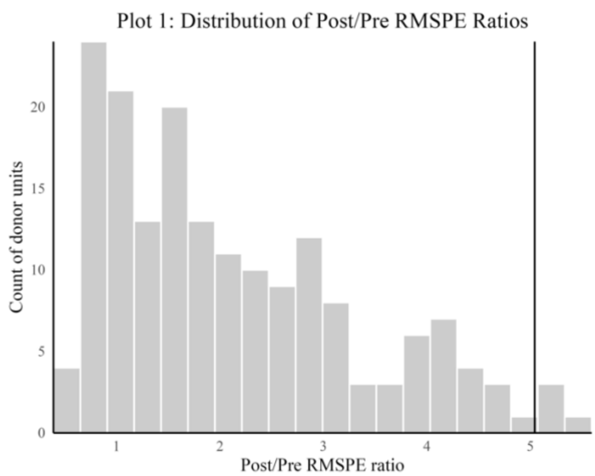
I use a synthetic control unit because the price of advanced semiconductor-based devices behaves in a unique way compared to the other goods in the CPI basket, which means that it would not be possible to support the assumption that the treated and control unit behave in the same way prior to the treatment taking place. The synthetic control unit combines 176 goods from the CPI basket. The five donor goods that weigh the largest in the synthetic control, along with their corresponding weights are displayed in Table 1.

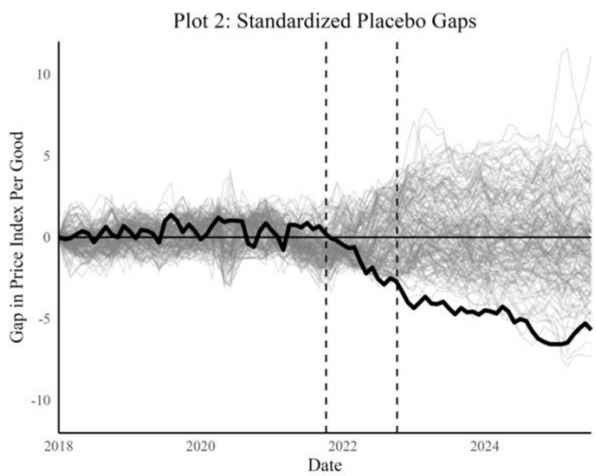
Good Name	BLS Good Code	Weight
Televisions	SERA01	0.22
Computer software and accessories	SEEE02	0.02
Video and audio products	SERAC	0.02
Toys	SERE01	0.01
Other recreational goods	SERE	0.01

Note: n = 176

Table 1: *Top 5 Synthetic Control Donor Goods*

The rank of the treated unit against all 176 donor goods in the synthetic control unit leaves just 2.9% of the donor pool with post- divided by pre-treatment Root Mean Square Percentage Error (RMSPE) ratios greater than the treated unit, which falls below the conventional 5% used for statistical significance. The treated unit's RMPSE ratio is 5.04, which means that deviation from the synthetic control unit is five times greater post-treatment than pre-treatment. The 0.029 p-value was optimised by iteratively removing 20 of CPI basket goods with the most extreme behaviour, measured by the highest RMSPE ratios. Plot 1 shows the treated unit RMSPE ratio rank against all of the retained donor goods in the synthetic control. Plot 2 depicts the placebo tests with all other goods, where each is normalised by their RMSPE. In both cases, the black line is the treated unit: computers CPI. The dashed lines represent the treatment date of the policy intent annoucements in September 2021, the August 2022 CHIPS and Science Act, and the October 2022 export controls implementation.





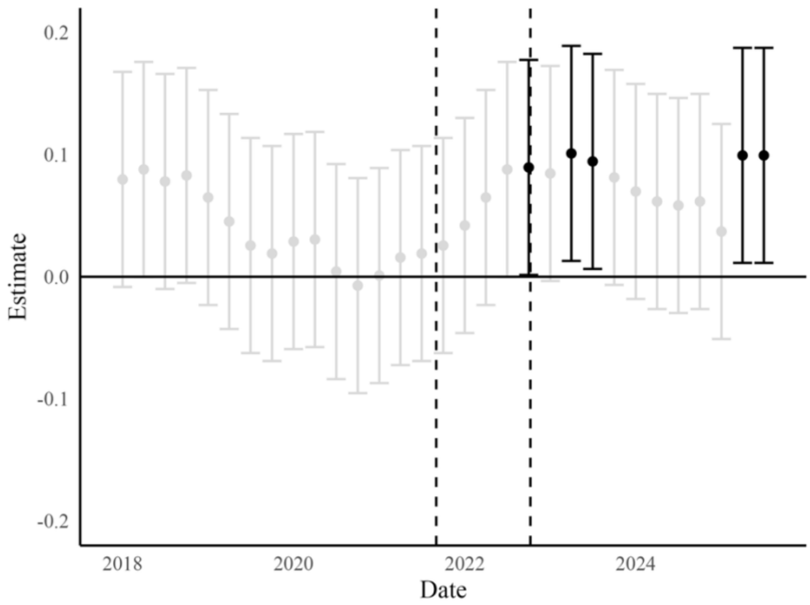
https://doi.org/10.14324/111.444.2755-0877.2018

In the second stage of my analysis, I use a difference-in-differences design with the same treatment. I use the import price index of semiconductors into the U.S. as the treated unit, and the import price of televisions and video receivers, which are not based on advanced semiconductors, as the control unit. The regression equation for the analysis is as follows, where the dependent variable is the computers import price index, Post is a dummy variable, determining whether the observation took place after the treatment date, and Treat takes the value of 1 if the observation is for the computers index, and 0 if the observation is for the control unit of televisions and video receivers.

$$\text{Semiconductors MXP} = \alpha + \beta_1 \text{Post} + \beta_2 \text{Treat} + \tau(\text{Post} \times \text{Treat}) + \varepsilon$$

Here, both the treated and control unit behave in a parallel manner before the treatment. Plot 3 shows the dynamic effects model of pre-treatment placebo tests. For each test, the treatment and treated time period are interacted, and the p-value of the interaction is below 0.05. This would suggest that the relationship between the treated and control unit did not change significantly prior to the treatment of October 2022, supporting our assumption of parallel trends.

Plot 3: Dynamic Effects Model



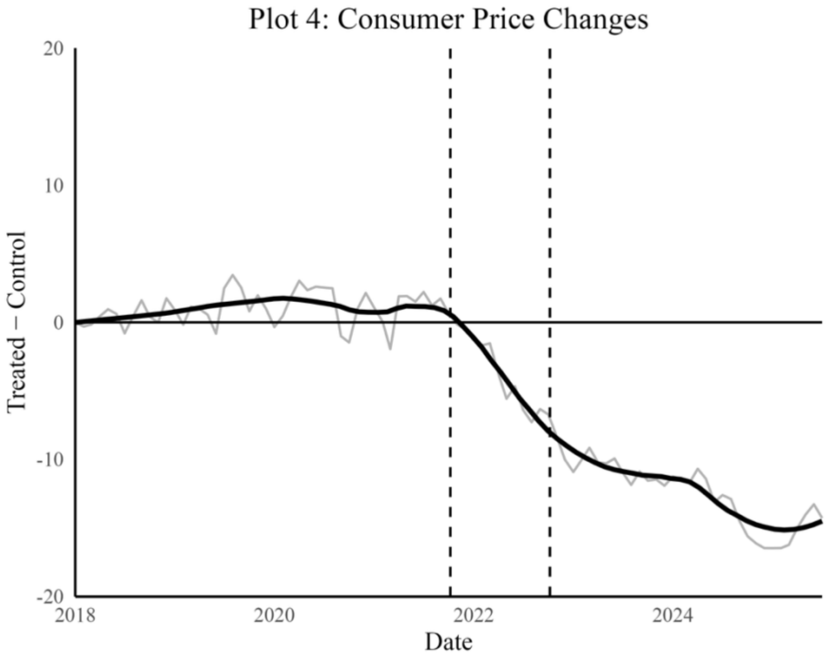
4.3. Discussion of Results

4.3.1. Stage 1

	Dependent variable: CPI	
	Policy Implementation	Intent of Policy Annoucement
Post-Treatment	4.733*** (0.443)	5.147*** (0.640)
Treated Unit	0.232 (0.552)	1.001 (0.643)
Post-Treatment × Treated Unit	-12.345*** (0.787)	-10.914*** (0.905)
Constant	94.973*** (0.426)	94.192*** (0.455)
Observations	182	182
R2	0.674	0.580
Adjusted R2	0.668	0.573
Residual Std. Error (df = 178)	2.689	3.052
F Statistic (df = 3; 178)	122.582***	81.846***
Note:	*p**p***p<0.001	

Table 2: *Computers CPI Event Study*

https://doi.org/10.14324/111.444.2755-0877.2018



We find a negative statistically significant effect of the export controls on the price of semiconductor-based devices paid by customers. After the imposition of export controls, the price index for computers fell by about 12.3 percentage points relative to a synthetic non-computer good in the CPI basket. Testing with the October 2021 annoucement of the intent of policy date for robustness, we also find a negative statistically significant effect on computer consumer prices: a decrease of 10.6 percentage points. Plot 4 visually demonstrates the difference between the treated and the synthetic control unit. As shown, the difference oscilates around zero before the date of the intent of policy annoucement, where the difference falls to negative ten. Following the policy implementation date, the computer prices continued to fall towards negative fifteen. This would suggest that the market began pricing in the potential policy at the time of the annoucement of its intention.

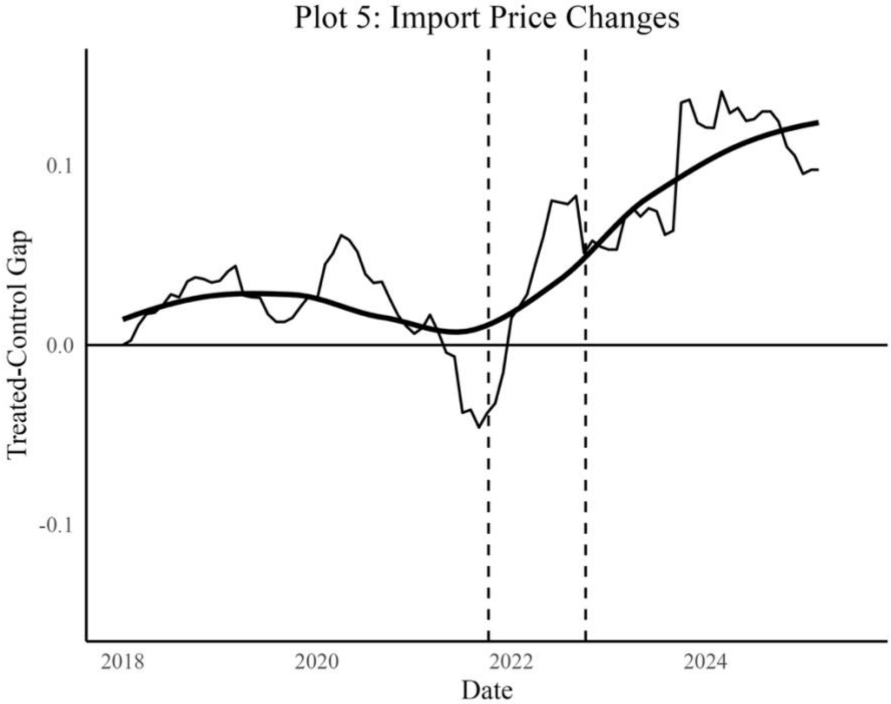
The results would indicate that the cost of export controls was not passed along to the customer. One interpretation is that, since the consumer prices did not increase, we can also assume that the cost of this policy was not passed onto U.S. businesses. If that was the case, companies could try to account for the higher cost by increasing device prices. Therefore, the cost of the policy may have been passed onto the U.S. government, or perhaps a foreign exporter. I test this hypothesis in the next stage.

4.3.2. Stage 2

	Dependent variable: MXP	
	Policy Implementation	Intent of Policy Annoucement
Post-Treatment	-5.227*** (0.870)	-3.271*** (0.878)
Treated Unit	2.418*** (0.607)	2.099** (0.718)
Post-Treatment × Treated Unit	8.325*** (1.033)	6.602*** (1.051)
Constant	93.928*** (0.438)	93.686*** (0.540)
Observations	182	182
R2	0.526	0.456
Adjusted R2	0.518	0.447
Residual Std. Error (df = 178)	3.277	3.509
F Statistic (df = 3; 178)	65.856***	49.821***
Note:	*p**p***p<0.001	

Table 3: *Semiconductor MXP Event Study*

https://doi.org/10.14324/111.444.2755-0877.2018



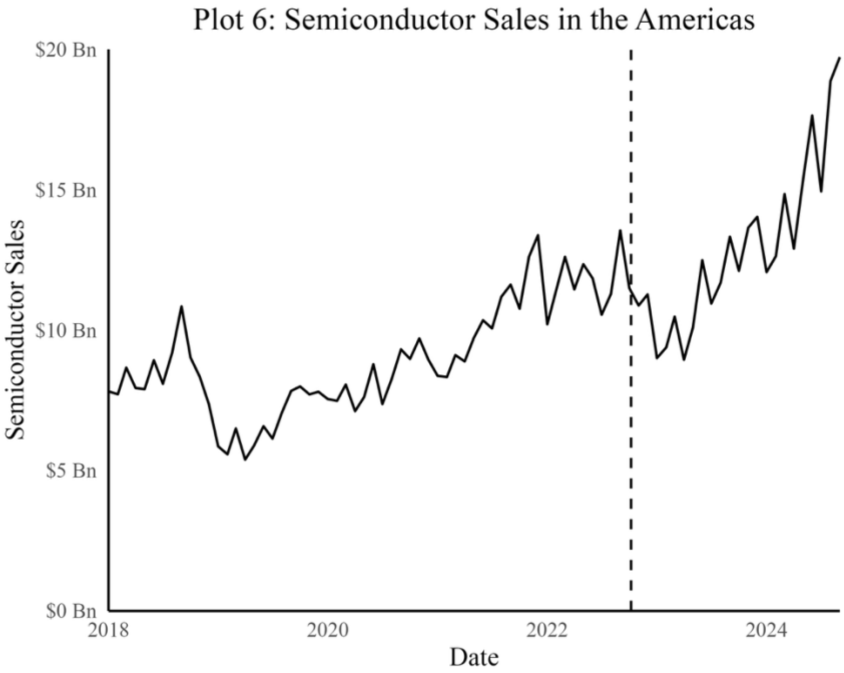
In this stage, we find a positive statistically significant effect of export controls on the import price of semiconductors. After the imposition of export controls, the price of semiconductor imports rose by about 8.3 percentage points relative to the price of televisions and video receivers. This could be interpreted in a way that suggests that the cost of the export controls was not passed along to foreign exporters. Higher import prices mean that domestic businesses have to import semiconductors for higher prices from abroad or turn to more expensive domestic chip producers. In both cases, the policy seems to harm U.S. businesses through subjecting them to higher costs. However, the effect of higher import prices, along with the lower consumer prices point towards a third party that absorbs the cost in between.

The combined findings indicate an effect of some government intervention, probably through subsidies. Through the CHIPS and Science Act, the government subsidised domestic chip production by lowering financing costs via tax credits, loan guarantees, grants, and other adjacent tools, providing incentives for investment in domestic development. These subsidies would have lowered firms' effective marginal costs, allowing them to charge more competitive (lower) prices for their products and maintain their price margins, while earning a higher profit through increased sales volume. The results from both stages suggest the U.S. government, and therefore taxpayers ultimately bears the cost of semiconductor export control policy.

4.4. Stylised Facts

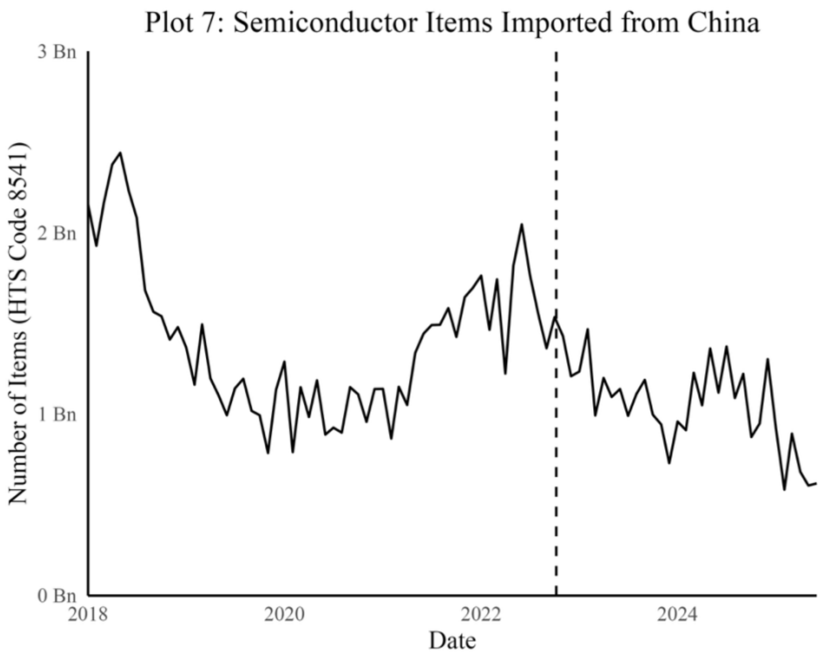
I support the findings with two sets of stylised facts. To support the findings from the first stage analysis, I use data on semiconductor-based product sales in the United States from the WSTS. I use data on the monthly sales of semiconductor-based products (World Semiconductor Trade Statistics, 2025). Values are in billions of dollars of semiconductors sold. I adjust these values according to the semiconductor price index to control for price inflation between 2018 and 2025. Plot 6 shows the results of this exercise.

https://doi.org/10.14324/111.444.2755-0877.2018



While consumption was steadily rising in the months leading up to the imposition of the export controls by the Biden Administration in October of 2022, the absolute value of purchases fell from October 2022 until the mid-2023. If we assume that demand is inelastic, because semiconductors are a necessity for large software companies and national security, then one could make the argument that the imposition of the combined export controls and domestic subsidies resulted in a decrease in prices.

I support the findings from stage two using import data on semiconductor items (HS-4 code 8541) imported from China to the United States from the United States International Trade Commission (United States International Trade Commission 2025). Plot 7 shows the raw number of items with HS-4 code 8541 imported from China each month between 2018 and 2025.



https://doi.org/10.14324/111.444.2755-0877.2018

The number of units imported into the United States from China fell continuously after the imposition of export controls. Whereas almost 2 billion semiconductors per month were being imported into the United States in the second half of 2022, by 2024, that number had halved. If, once again, we assume that demand for semiconductors is inelastic, then the reduction in units imported would suggest that the higher prices of Chinese semiconductors dissuaded American consumers from purchasing Chinese products. This supports the findings from stage 2 by suggesting that the imposition of export controls caused import prices to rise.

4.5. Limitations

There are several limitations of the results. Firstly, it is apparent that the treatment effect started before the October 7th, 2022 imposition date. Specifically, it appears that the effect begins in September of 2021. While this is a year before the policy was implemented, it aligns with the intent of policy announcement date. In September 2021, the Biden Administration expressed its intention to pursue a strategy of export controls on high priority items, including semiconductors (Toussaint et al. 2022). It is likely that the market began to restructure supply chains and take anticipatory measures before the actual export controls were imposed, but after the announcement.

Secondly, time-varying confounders also threaten the ability of the consumer stage to make a causal inference. Specifically, the CHIPS and Science Act was passed in August 2022, which may affect the strength of the treatment effect. However, while my analysis focused on export controls, I believe that the CHIPS Act is a complementary policy to the export controls, and thus it makes sense to interpret them together.

Thirdly, the results are subject to limitations arising from potential differences in the effects for varying types of semiconductors which have different prices. The treatment effect may be different for various levels of advancement. This is very probable, considering that the export controls only affect advanced semiconductors. Therefore, the effect on import prices of solely the products on the export control list could be even stronger.

Finally, there are limitations arising from my use of import and consumer price indices as treated units. Price indices do not fully capture the impact of innovation and market dynamics, specifically, they do not capture the government spending on subsidies.

5. Conclusion

My main contributions are my empirical findings, and the theoretical framework that they support. The findings of lower customer price of computers show that, even though they are a negative policy, export controls shape domestic markets. Moreover, the higher import prices suggest that national policy can also shape foreign markets. It is important to note that government subsidies are a vital middle step tying these results together. I consider the export controls and the CHIPS and Science Act as complementary components of a larger U.S. innovation strategy. As a result, the U.S. can foster domestic innovation while maintaining economic security. A side effect is that the policy incentivises China to promote its innovation sector through large investments (Gupta, Borges, and Palazzi 2024).

My theory extends the frameworks of Ludvall and Mazzucato and contextualises that of Atkinson & Ezell. From the empirical findings, the paper finds that mercantilist policies, such as export controls, can be a tool of mission-oriented innovation policy that shapes both domestic and foreign markets. Therefore, even though they restrict the systemic flow of knowledge, mercantilist policies can be beneficial for innovation processes both domestically and for the target state. Finally, negative protectionist policies may be a rational response when an actor within the international innovation system pursues mercantilist policies.

My theoretical contribution can guide future policy decisions. When designing innovation policy, it is vital to consider how it will affect the innovation policy of the target state and other states within the global innovation system. Foreign states' innovation policy can reflect back on the implementing country which is visible through higher import prices. It is also important to implement policies in alignment with other international market actors. The short-term harm to domestic businesses post-implementation was partly fueled by the innovation policy misalignment between the U.S., the Netherlands, and Japan (Schleich and Denamiel 2024). The rest of the cause can be attributed to the anticipated retaliation of the target state. Policymakers can also consider mitigating these effects through alternative policy options, such as diplomacy or

https://doi.org/10.14324/111.444.2755-0877.2018

institutional engagement. On the other hand, they could implement stronger policy tools, such as tariffs, sanctions, or embargoes.

In conclusion, this paper's findings suggest that the U.S. government bears the predominant cost of the October 2022 export controls. Using data from the U.S. Bureau of Labour Statistics in a difference-in-differences design, I measure the effect of export controls on the import price of semiconductors and consumer price of semiconductor-based devices. The findings build on mission-oriented innovation policy and national innovation systems theory to suggest that innovation mercantilism can be a sound innovation policy in a competitive geopolitical landscape, and that there should be greater consideration of foreign policy reactions when shaping innovation policy.

Future research should investigate the effects of export controls on measures of innovation and explore the mechanisms that directly affect global innovation processes. Future studies should seek to reduce the limitations I identified in my empirical analysis, specifically regarding the use of price indices and lack of differentiation between the types of semiconductors.

https://doi.org/10.14324/111.444.2755-0877.2018

References

Atkinson, Robert (2012). “Innovation economics: the race for global advantage”. Practicing sustainability. Springer, pp. 123–126.

Bateman, Jon (2022). “US-China technological “decoupling”: A strategy and policy framework”. Carnegie Endowment for International Peace.

Benson, Emily (2023). “Updated October 7 Semiconductor Export Controls”. Center for Strategic and International Studies.

Bown, Chad P (2019). “Export controls: America’s other national security threat”. Duke Journal of Comparative and International Law 30, p. 283.

Bureau of Labor Statistics (2025a). Import Price Index.

— (2025b). Consumer Price Index: All Urban Consumers.

Crosignani, Matteo et al. (2024). “The Anatomy of Export Controls”. Liberty Street Economics.

Gupta, Kirti, Chris Borges, and Andrea L Palazzi (2024). “Collateral Damage: The Domestic Impact of U.S. Semiconductor Export Controls”. Center for Strategic and International Studies.

Lundvall, Beng-Ake (2007). “National innovation systems—analytical concept and development tool”. Industry and innovation 14.1, pp. 95–119.

Mazzucato, Mariana (2017). “Mission-oriented innovation policy: challenges and opportunities”.

Ricardo, David (2005). “From the principles of political economy and taxation”. Readings in the economics of the division of labor: The classical tradition. World Scientific, pp. 127–130.

Schleich, Matthew and Thibault Denamiel (2024). “Why US Semiconductor Export Controls Backfire”. The Diplomat.

Shin, Eunkyung Kim, Nicholas F. Coward, and Daniel Andreeff. 2021. “Biden Administration Supply Chain Reports Deeper Dive #3: White House 100-Day Review of Semiconductor and Advanced Packaging Supply Chain Recommends Strengthening Export Controls.” Baker McKenzie Global Supply Chain Compliance.

Steinberg, Federico (2023). “The Neo-mercantilist Moment”. Center for Strategic and International Studies.

Tausche, Kayla, and Amanda Macias. 2021. “U.S. Needs to Work with Europe to Slow China’s Innovation Rate, Raimondo Says.” CNBC.

Toussaint, Scott et al. (2022). “Year-End Sanctions and Export Controls Update”.

United States International Trade Commission (2025). DataWeb: U.S. Trade Tariff Data.

World Semiconductor Trade Statistics. (2025). More than 35 years authentic market monitoring by WSTS.

Yip, George S and Bruce McKern (2016). China’s next strategic advantage: From imitation to innovation. MIT press.

https://doi.org/10.14324/111.444.2755-0877.2018