

Industrial policy options for a post-pandemic global economy.

Bachelor Thesis for Obtaining the Degree

Bachelor of Science

International Management

Submitted to Mithat Külür

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Affidavit

I hereby affirm that this Bachelor's Thesis represents my own written work and that I have used no sources and aids other than those indicated. All passages quoted from publications or paraphrased from these sources are properly cited and attributed. In particular, I did not use any text generators or other paraphrasing tools. My thesis was not proofread.

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Abstract

Recent events such as the Covid-19 pandemic, economic competition between the United States and China, and Russia's invasion of Ukraine emphasized the fragility of the interdependency of the economic system. The geopolitical tensions and fragmentation of supply chains made industrial policy seem unavoidable. Industrial policy (IP) has a potential to restructure globalization, making countries more robust in the face of economic shocks. Thus, the aim of this research is to understand the primary motivation for industrial policy in industrialized countries, how IP can be crafted to make economies more resilient to economic shocks, and to analyze the impact IP will have on the market. Furthermore, the paper delves into the discussion of how IP can be used to address geopolitical concerns and analyze its influence on shaping economic relations between nations, using Biden's Administration Inflation Reduction Act (IRA) as an example.

Following a comprehensive review of existing literature, primary data was obtained in a form of a semi-structured, open-ended interview with the experts in the field of industrial policy. The experts indicate the significance of industrial policy to address climate change and promote green industries, as well as investment in R&D to generate positive externalities and enhance innovation. However, other elements of industrial policy are subject to diverse opinions. The implementation of IP is a complex process influenced by factors such as political base, economic position, and geopolitical considerations. The shape of globalization is expected to change since countries are prioritizing domestic industries development, with IRA as a driving force. Lastly, the findings suggest the need for international cooperation among countries and organizations.

Keywords: Industrial policy, market failures, Inflation Reduction Act

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List of Abbreviations

WTO - World Trade Organization

GATT - General Agreement on Tariffs and Trade

NAFTA - North American Free Trade Agreement

IP - Industrial Policy

IRA - Inflation Reduction Act

FDI - Foreign Direct Investment

R&D - Research and Design

SMEs - Small and Medium Enterprises

1 Introduction

1.1 Background

In the early part of 19 century, new technologies restructured global communication and transportation system, simultaneously reducing trade costs; moreover, as the concept of free market economists like Adam Smith and David Ricardo were implemented, the economic narrative changed, leading to the government moderating restrictions on trade, and the gold standard enabling capital to move globally without arbitrary fluctuations in currency values (Rodrik, 2011). However, this first era of unmanaged globalization crashed when World War I caused economic instability and disrupted international trade (Taylor & Glick, 2010).

It was followed by the Great Depression, which resulted in countries implementing government intervention and protectionist policies in terms of trade barriers and increases in tariff rates, which led to international trade collapse, slowed down economic growth (Madsen, 2001), and reduced confidence in financial markets, leading to financial shocks, banking crises, and decline in open market operations (Calomiris, 1993).

Finally, World War II led to a long-term impact on globalization, as countries focused on rebuilding their economies (Clark, 2001). For instance, Japan went through a challenging period after WWII, stimulating the government to intervene and enhance industrial development through subsidies for research and development, exports, and investments (Chang, Andreoni, & Kuan, 2013). These interventions made Japan one of the strongest competitors in the world in the steel, automobile, and electronics industries (Noland, 2007). The government was able to facilitate the improvement of information flows between the public and private sectors, as well as facilitate knowledge spillovers within the private sector, leading to innovations (Chang, Andreoni, & Kuan, 2013). Similarly, countries like Korea, Taiwan, and China have replicated Japanese industrial policies. Korean private sector was far behind the Japanese one, making the government intervention more centralized. The government directed R&D funding toward strategic industries like high-tech and

biotech, resulting in rapid growth and structural transformation (Chang, 1993). Moreover, Taiwan also implemented government interventions in the forms of subsidies, strategies, and substitutions to the private sector, which led to rapid economic growth and significant technological advancements (Khan & Blankenburg, 2009).

Lastly, the end of colonialism and decolonization of developing countries resulted in new independent nation-states and the establishment of new international politico-economic order. It led to the reorientation of trade and investment flows (Berger, 2008). Largely influenced by the United States interventions, known as the Marshall Plan, a European economic growth model emerged, resulting in significant global developments (Chassé, 2014).

The second era of globalization began in the late 20th century. It was mainly characterized by the digital revolution and substantial policy reforms by the national governments, encouraging international trade and investment (Mukherjee, 2008). As a result, a new global order was established in terms of the international production network, the growth of global value chains, a decrease in trade costs of goods, new market opportunities, and, therefore, a higher efficiency (Fujita & Thisse, 2006). GATT (General Agreement on Tariffs and Trade) emerged as the initial framework, as a negotiation platform to facilitate countries' reaching voluntary agreements on reducing tariffs. GATT was transformed into the WTO in 1995, which took a broader role of policymaking, and compliance enforcement, mediated trade disagreements, and forced countries into compliance when free trade rules were not being followed (Deardorff & Stern, 2002). Furthermore, the Common Market, which became the fundamental aspect of the European Union (EU), fostered economic collaboration within EU member countries, removing tariffs and allowing unrestricted flow of products, capital, and people (Liesner, 1958).

1.2 Introduction to Problem

For the past 40 years, neoliberal economic thinking has dominated the global market (Feroohar, 2022), driven by the free-market fundamentalism; a set of policies and governance arrangements that promote privatization, the liberalization of markets,

and, therefore, more competition (Barnett, 2005). The assumption that lowering trade barriers, deregulating capital markets and global finance, and letting the invisible hand operate through the economic system, which has developed free-market globalism, has resulted in consumers benefitting from low-priced foreign manufactured goods (Foroohar, 2022). However, neoliberal policies also caused a significant growth of social inequalities and disrupted capital flows within and among countries that implemented those policies due to privatization and financial instability (Navarro, 2007).

The invisible hand and the free-market system have worked out differently among countries and in different parts of the world. According to Adam Smith, for a free market to operate correctly, a shared moral framework should be developed and shared by the parties involved (Smith, 2013); however, as China joined the WTO, and the United States has become involved with countries in Middle East, Latin America, and Russia, the moral framework has developed differently among countries involved (Foroohar, 2022). As a result, globalization stalled, especially after the 2008–9 financial crisis. The Covid-19 pandemic made clear the fragility of thinly stretched global supply chains. The breakout of aggressive economic competition between the United States and China, as well as Russia's invasion of Ukraine, exposed the fragility of the interdependency of the economic system (Foroohar, 2022). The aim of the globalization of supply chains was to enhance efficiency, accessibility to the market, and lower costs; however, facing different types of shocks emphasized the vulnerability of the production networks and the need for transparency and resilience (Lund et al., 2020).

1.3 Research Focus

Relying on an autocratic government for significant supplies, expecting countries with different political economies and priorities to follow the same trade rules, and transporting scarce resources over long distances was an overreach and not an environmentally sustainable option (Foroohar, 2022). Furthermore, recent events have underlined the need for companies to start moving toward home shoring and

friend shoring as the changes in the global economy are growing the frequency of economic shocks (Lund et al., 2020).

Industrial policy is a set of government interventions in the market, which can be introduced in different forms like subsidies, tax incentives, trade policies, etc. The goal of implementing industrial policies is to address market failures and promote the development of sectors with potential future competitiveness. For example, industrial policy can be enforced in developed countries to promote innovation, technological advancement and competitiveness in specific sectors (Rodrik, 2004).

Industrial policy has been implemented several times throughout the history of economic development. For instance, after World War II, some countries implemented industrial policies to protect emerging industries and local production. However, the intervention failed due to a lack of competition (Aghion et al., 2012). Nevertheless, industrial policy is a process of ongoing discovery and controversy of how well the government can intervene in the market (Rodrik, 2008).

As geopolitical tensions and supply chain fragmentations are growing and national security is shaping economic policy, industrial policy is said to be inevitable (Spence, 2023). Today, industrial policy could be used to restructure globalization to make countries more robust in the face of economic shocks and globalization because it can be adapted to the needs of each country and its industries, can help to address market failures, and promote resilience and sustainable development (Rodrik, 2023).

Therefore, the aim of this research is to understand the primary motivation for industrial policy in industrialized countries, how implementing industrial policy can make countries more resilient, and what impact it will have on the market. Furthermore, the paper will discuss how industrial policy can be used to address geopolitical concerns and how implementing industrial policy will shape economic relations between countries. It will also examine different types of market failures and how industrial policy can be used to address them.

Hence, the main research questions of this thesis are as follows:

- What are the main motivations for industrial policy in industrialized countries?
- How can industrial policy be crafted to make the global economy more resilient to external shocks?
- How can industrial policy be used as a tool for addressing geopolitical concerns?
- What impact will industrial policy have on market efficiency?
- What are the potential impacts of the Biden Administration's Inflation Reduction Act?

2 Literature Review

The debates on the topic of industrial policy are a sign of growing political concerns regarding globalization, the impact of free trade, and debates on the role of government in a market fundamentalism economy (Cohen, 2006).

2.1 Defining Industrial Policy

According to Saggi and Pack, industrial policy (IP) is a type of government intervention that seeks to alter the structure of the manufacturing industry to enhance economic growth, which would not be possible through market equilibrium (2006). IP involves the government determining which industries and technologies should be supported, how much support they should receive, and in what form that support will be introduced (Mazzucato, 2013). The implementation of industrial policy also varies between countries based on their economic and political situation, industrial structure, and human capital (Rodrik, 2008).

While the implementation of industrial policy to promote local production might result in inefficiency and hurt the economy in the short term, the efficiency, it is assumed, will be re-achieved in the long run when the industry is opened to global trade, resulting in higher productivity and better performance in terms of sustainable economic growth (Terzi et al., 2022). Therefore, the long-term aim of industrial policy is to reinforce the efficiency and international competitiveness of local manufacturing sectors based on the government decisions to invest, innovate, or adapt new technologies, affecting the location, structure, nature of the manufacturing sectors, and its ties to global economy (Crafts & Hughes, 2013).

Furthermore, Rodrik argues that tax incentives and subsidies for activities that are thought to promote economic development should not be the primary focus of industrial policy, and it should instead support the formation of a strategic partnership between the government and the private sector with the objective of locating and eliminating the key barriers to economic progress (2004).

2.1.1 Implementation of Industrial Policy

The implementation of industrial policy varies across countries, sectors, and industrial structures (Rodrik, 2008). For example, manufacturing in one industry can be preferable to the other due to geopolitical, security, and military implications. Some industries are also dependent on other countries for critical raw materials, which are essential for technological advances; disruption of the supply chain due to geopolitical tensions would result in severe consequences for the country's economy and industry (Terzi et al., 2022). The industrial policy aims to affect the industry's resource allocation and possible techniques to address such market failures (Stiglitz, 2017). Therefore, the government would intervene to stimulate the production structures of those sectors and create compelling economic and geopolitical motives (Terzi et al., 2022). Furthermore, implementing industrial policy depends on the political economy of the country; if the country does not have a political base for industrial policy, it may lead to overvalued exchange rates that negatively affect export-oriented manufacturing industries (Chang et al., 2013).

Moreover, it is essential for the government to have an ongoing exchange of information with the private sector to stimulate public-private consultation and establish an effective government intervention in the market (Fong, 1990). Consequently, the implementation of industrial policy depends on different circumstances and the country's capabilities; therefore, industrial policy is also a process of ongoing discovery of how well the government can respond to economic opportunities and engage with the private sector (Rodrik, 2008).

2.1.2 Horizontal vs. Vertical Industrial Policies

The industrial policy approach is generally categorized into 'horizontal' and 'selective' types. 'Horizontal' industrial policy is widely applied across industries and concerns economic growth (Crafts & Hughes, 2013). Also defined as a 'general' or 'functional' type, it focuses on 'public goods' that benefit all sectors equally (Chang et al., 2013). 'Selective' industrial policy aims to enhance the performance of particular sectors or industries (Crafts & Hughes, 2013). Also known as 'sectoral industrial policy,' 'vertical,' or 'targeting,' it aims to favor firms or industries against market signals and achieve

efficiency in the long terms (Chang et al., 2013). Furthermore, Aghion et al. main findings suggest that selective industrial policies increase productivity growth by targeting competitive industries and increasing competition (2012).

The vertical industrial policy can be used to address market failures, alter the market fundamentalist approach, and let policymakers decide on firms' entry or exit in the industry (Crafts & Hughes, 2013). Nevertheless, the government's pursuit of targeting industrial policy should also account for informational constraints. According to Klimenko, policymakers responsible for vertical industrial policy may fail to determine the industry that would have a comparative advantage in the economy; that might result in the government 'picking the losers instead of the winners' and lead to countries specializing in industries with inferior technologies, abandoning sectors that have a comparative advantage (2004). Moreover, critics point out that the state's interests may influence the decision-making process when it comes to public investments in industries (Spence, 2023).

However, Cohen states, as recent events have demonstrated, large corporations are equally prone to criticism and have no more remarkable foresight than governments in terms of the future development of markets for emerging technologies (2006). Moreover, according to Rodrik, the statement that the government cannot pick winners is commonly used as an argument against industrial policy; however, the procedure of industrial policy is to identify industries that are failing to reach the objectives of industrial policy and to phase out the support for them (2008).

2.1.3 The Rationale for Industrial Policy

Governments implement tariffs and tax policies to shift manufacturing industries based on emerging technologies, input costs, and the availability of a specialized workforce. Nevertheless, new factors, such as risk, resilience, and national competitiveness are also considered when policymakers implement policies to strengthen the country's economic development strategies and capture leading shares of emerging technologies (Lund et al., 2020).

Critics of the industrial policy have long believed that companies are better off when forced to compete in a free-market economy and that government should not intervene by regulating or subsidizing industries. Nevertheless, as an example, the outcome of globalization for the United States producers made critics reconsider the need for government intervention in the market (Dodd, 2023). Internal political pressures and the rise of geopolitical tensions between the US and China resulted in the US renouncing international trade and investment and prioritizing the focus on the domestic economy and local production (Rodrik, 2023).

As a result, Joe Biden's Administration established several new programs, including the Infrastructure Investment and Jobs Act, the CHIPS and Science Act, and the Inflation Reduction Act (IRA), that aim to strengthen the United States economy through supply-side investments and improve vital industries like semiconductors and renewable energy (Tyson & Mendonca, 2023).

The IRA is a set of climate change initiatives that aim to reduce greenhouse gas emissions and use this type of industrial policy to outperform in competition with China and enhance US energy security. The Inflation Reduction Bill is introduced in various forms, such as clean energy investments, tax incentives, grants, loan programs, and other policies that aim to reduce carbon emissions, support domestic production, and reinstate the US international reputation (Newell, 2022).

One of the US goals is to obstruct China's advancement in the latest technologies, including artificial intelligence and semiconductors, rather than focus on efficiency. Furthermore, restrictions on trade, investment, and technology flow to China will have a wide-ranging effect on the US's trading partners and the structure of the world economy (Spence, 2023). The new policy frameworks emphasize not only strategic public investment but also promote local manufacturing of goods and services, as well as the value of domestic economies, to address the full range of challenges that the US is facing (Slaughter & Garlow, 2023).

Since the IRA was signed, some European allies have been agitated because it also targeted component imports from the E.U. that could potentially start a new trade war between the US and Europe. The new industrial policy is threatening the

European business already affected by the Russian invasion of Ukraine (Wong & Tucker, 2023). Furthermore, this tension has led to the decline of the international economic order, which was already shaken by the shocks, such as the presidency of Donald Trump and the United Kingdom's exit from the EU (Wong & Tucker, 2023). In such cases, industrial policy is determined by geopolitical and economic factors. If implemented correctly, this industrial policy could make the US a more competitive and sustainable country (Deutch & Ernest, 2022).

2.2 The Use of Industrial Policy

The conventional justification for selective IP has been based on market failures that occur when externalities, information asymmetries, or scale economies result in the absence or incomplete competitive markets (Ul Haque, 2007). According to Rodrik, government intervention in the form of industrial policy is justified even when the most common market failures occur, such as insufficient investments in public goods, financial market imperfections, and learning spillovers (2008).

Therefore, the use of industrial policy is characterized by the following actions:

- defining policies that would enhance economic development in terms of competitiveness and productivity rather than welfare
- guiding the market
- engaging in consultation and coordination with the private sector to stimulate policy formation and implementation (Johnson, 1982)
- assigning long-term goals for the economy
- providing indirect assistance in the form of foreign direct investment (FDI), ease in regulations, and establishment of trade barriers
- providing capital investment for research and design (R&D) facilities (Tekin, 2016)

In response to the market failures argument, skeptics usually argue for the need for horizontal industrial policy. However, Rodrik argues that in practice, most interventions support certain activities over others, defined as selective industrial policy (2008).

The following section examines the type of market failures and the justification for government intervention.

2.2.1 Asymmetric Information and Market Competition

Asymmetric information refers to how participants determine the cost structure of the economy when there are imbalances in the knowledge of certain factors (Cohen, 2006). Typically, private returns from being the first movers in the market are lower than social benefits; therefore, the process of establishing the cost structure for new goods (pioneer investors) would be subsidized by the government to engage firms in this type of innovation (Hausmann & Rodrik, 2006).

The market is considered to be incomplete when firms are facing public goods problems, when the demanded goods or services are not available, or the quality of goods is impossible to evaluate based on average comparable goods (Magill & Shafer, 1991). In such an economy, industries need equal access to information because competition is limited, which leads to companies implementing strategies that create imperfections in the market setting. Consequently, there is a risk that firms that offer goods or services above average will be forced to exit the market (Cohen, 2006). Furthermore, when markets are incomplete, there is a risk of coordination failures, where the return on investment depends on whether other investments were made; therefore, the government needs to ensure that interlinked investments are carried out (Hausmann & Rodrik, 2006).

Moreover, based on the 'monopoly replacement effect,' some industries opt to operate in sectors where they would encounter lower competition in the market, resulting in high sectoral concentration and low incentives to innovate. In this scenario, industrial policy can be used to encourage businesses to develop by increasing the competition, providing incentives to operate in the same industry, and reducing concentration in that sector (Aghion et al., 2012).

2.2.2 Externalities

One typical example of a positive externality is R&D because it contributes to development by expanding information and knowledge and has a positive impact on

the economy in general (Helbling, 2010). However, since the pure market economy does not reward firms that generate those so-called technological externalities, the R&D activity tends to be lower than its potential, which generates a need for government intervention (Cohen, 2006). Since new technologies are based on spillovers from earlier inventions, which stimulate the public and private sectors to enhance knowledge creation through government investment in R&D (Martin et al., 2021). For example, public investment in human capital related to research, science, and technology is one of the main objectives for the US to ensure its advantage in strategic competition with China (Spence, 2023).

Climate change is a classic example of a negative externality and conceivably the most critical market failure in the global economy. To address climate change and reduce emissions, the government could impose carbon pricing (to correct market signals) or provide incentives in the form of subsidies for firms to use renewable energy and adopt new green technologies (Page & Tarp, 2017). As there is a need for new low-carbon technologies, the issue of technological competition is rising, and national economic development is focusing on the production and export of high-tech goods with a low-carbon energy supply to ensure robust growth and to offer a technological solution to address climate change (Semieniuk, 2022).

2.2.3 Economies of Scale

According to Krugman, an industry characterized by economies of scale indicates high fixed costs that constitute entry barriers (Cohen, 2006) and gains a first-mover advantage that hinders other firms from entering that market (1987). Economies of scale and high fixed costs justify government intervention in the form of subsidies, which would allow other firms to enter the market (Cohen, 2006).

Fagerberg highlights that government intervention, in this case, is justifiable when the aim is to establish compelling conditions for other firms to enter the market and stimulate the development of new technologies (1999). Therefore, government intervention is carried out not only to help countries benefit from economies of scale but also to support high-technology industries and account for positive technological externalities (Cohen, 2006).

Furthermore, industrial policy is used to develop domestic industries by imposing measures such as subsidies and quantitative restrictions to support innovation and competitiveness of the country in the global economy and to restructure the local economy by developing new industries with advanced manufacturing (Lane, 2020).

2.3 The Future Direction of the Industrial Policy

According to Grossman et al., to make the production network more resilient to supply chain breakdowns due to geopolitical disputes, transportation failures, and pandemics, which are often rather costly, the government would need to implement policies, which would either stimulate or discourage diversification and would choose between local or extensive manufacturing (2021). Especially due to recent events, the global semiconductor supply chain is shifting towards more reliable trading partners, and the supply side of the economy is reshaped to support national security and economic resilience rather than to increase efficiency (Spence, 2023). Therefore, industrial policy is used as an intentional political intervention that aims to shift the industrial structure of the economy based on geopolitical and economic circumstances (Lane, 2020).

To conclude, the industrial policy seems unavoidable at a time of increasing geopolitical tensions and supply chain fragmentation, as national security concerns are guiding economic policy due to higher risks of war. Therefore, it is crucial to focus on learning from past experiences, setting standards for evaluating performance, and identifying the potential risks of each approach since not all objectives align with economic efficiency (Spence, 2023). Although countries are moving toward domestic manufacturing, that does not indicate the ending of globalization opportunities (Lund et al., 2020).

2.4 Knowledge Gap

The literature review part covered the theoretical framework concerning the use of industrial policy in industrialized economies. The section explored potential threats and benefits associated with industrial policy, as well as the distinction between short-term and long-term implementations of IP. Previous researchers examined the use of

the Inflation Reduction Act to address climate change and restore the international reputation of the US.

Additionally, the existing literature underlines the occurrence of supply chain fragmentation and the relocation of business operations to strengthen resilience towards economic shocks. Nonetheless, especially considering the recent rise of tensions between the US and China, there is still a lack of comprehensive research that explores how industrial policy can address geopolitical concerns, which consequently influences worldwide supply chains. It is clearly evident from the E.U.'s reaction to the Biden Administration's IRA that global economies have become inextricably interlinked. Efforts to address perceived aggressive behavior by China while promoting competitive green industry at home, the US has caused damage to E.U. interests. On the one hand it has put barriers to imports from E.U. suppliers of components and products for green industry, on the other hand it is causing difficulties to E.U.'s other trade links. Trade with China and other countries is more crucial to the E.U. economies than the U.S. which is much more self-sufficient in energy and other inputs.

Gaining a deeper understanding of the underlining issues presents the foundation for policy makers to develop competitive advantage without damaging mutually beneficial linkages while further amplifying technological innovations. Furthermore, extended research is required to examine how the various means through which countries prioritize domestic manufacturing over the benefits of globalized connectiveness would impact current trends in globalization.

Based on the insights of the collected data, this research aims to contribute to the discussion by examining the influences of the Inflation Reduction Act on the private sector and the broader market. Derived conclusions will be a valuable addition and shed light on current uncertainties.

3 Methodology

This research aims to understand the role of industrial policy in building a country's economic resilience to global economic shocks and making countries more competitive in globalization. Furthermore, the aim is to analyze how different aspects, such as market failures, geopolitical events, technological competition, green industry development, competition between authoritarian and liberal democracies and the private sector interact and influence the role and objectives of industrial policy in globalization. Finally, the aim is to examine how Biden's Administration Inflation Reduction Act might tackle and influence those aspects.

The following section will elaborate on the methodology by elucidating the framework and structure of the research.

3.1 Research Approach

One of the essential steps in conducting research is to choose the best-suited method for collecting and analyzing data. Various methods have been developed and classified into qualitative, quantitative, and mixed approaches (Ramona, 2011). This research uses a qualitative approach to understand a more complex phenomenon of a fast-changing global order that cannot be readily measured from a quantitative, sometimes called numerical, point of view (Jemna, 2016). Moreover, the quantitative research approach helps to analyze the data more extensively by ensuring a better understanding of people's experiences, attitudes, and interactions (Pathak et al., 2013).

During qualitative research, the respondents are asked open-ended questions, and the researcher's goal is to understand the individual opinion of the participants on the topic studied (Creswell, 2014). Qualitative research is explanatory; the collected data is not statistically representative of the population. The sampling method depends on the people who meet the conditions of the study objective; for this research, people will be selected based on their knowledge of industrial policy and globalization (Jemna, 2016). Qualitative research is inductive, from individual premises to general statements. This approach has disadvantages, such as a lack of generalization and

validation, limitations, such as a large amount of non-significant data, risk of moving away from the focus, and subjectivity in the data analysis (Jemna, 2016).

3.2 Research Design

The appropriate methodology in qualitative research depends on the study's focus, objective, and research question. Since the research topic of industrial policy is somewhat complex and requires a systematic approach, the phenomenological design is used as a qualitative research method. This approach involves interviewing experts who have experience in the field of industrial policy. The interview aims to get an insight into the structural context and a person's in-depth knowledge of the subject. Moreover, the discussions will help to investigate the research question from various experienced perspectives (Monke, 2007).

3.3 Data Collection

A semi-structured, open-ended interview will be conducted, consisting of predetermined questions to direct the interview. It will be followed by additional questions that may occur during the interview to explore individual responses further or ask for clarification if something needs to be clearly understood. The interviewee is free to share as much information as they like and may choose not to answer the questions. The data will be collected via 'an asynchronous email exchange,' which would give the participants more flexibility since they are in different time zones. A set of questions is sent as a Word document which can be edited by participants to canvas their thoughts/opinions on the categories.

3.4 Interview Questions

The questions are divided into five categories. The respondents can write their answers to each category rather than answering every single question, which would give them more flexibility in sharing their expertise. The following section examines the content of the Word documents sent to experts in the field studied. The categories are:

3.4.1 The Main Motivation for Industrial Policy in Industrialized Countries

- i. Trade, outsourcing, and outward FDI have created winner and loser groups within developed economies. To what extent is IP (Industrial policy) a **political tool** to dampen domestic discontent through protection and support (rather than trying to deal with the issue through other means like redistribution, retraining, etc.).
- ii. To what extent is IP an **economic tool** to address the following market failures:
 - a. insufficient investments in public goods; information asymmetries; basic research, etc.;
 - b. protect strategic sectors, enhance the resilience of the economy;
 - c. support critical objectives like climate change (this could be both a market failure due to ineffective costing of environmental costs and a political failure).

This category focuses on distinguishing whether an industrial policy is more an economic tool to protect and develop domestic industries and address market failures or a political tool to dampen discontent due to job losses.

The need for an industrial policy for the green industry could be regarded as a response to market failures because environmental degradation needs to be sufficiently costed in market calculations. Therefore, green industry development needs an industrial policy to properly determine the impact of private sector operations on the environment. Furthermore, this category examines how much industrial policy is due to market failures and how much industrial policy is due to political failures. For example, there is a need for industrial policy to target environmental issues because there is a political failure in properly calculating environmental costs. Lastly, because of international interactions, there is political pressure from countries that choose protection over redistribution.

3.4.2 Industrial Policy to Prioritize Resilience over Efficiency

How can IP be crafted to make the national economy (and global economy) more resilient to external shocks by supporting international companies to build resilience into their supply chains?

This category focuses on the external shocks that affect the economy that requires industrial policy but also the operations of international companies. As companies are taking actions to respond to events, such as the pandemic, the Russian war in Ukraine, and China and US competition, they are building contingencies to be more robust which results in increased costs and reduced efficiency. Therefore, this category aims to understand the role of industrial policy in supporting the private sector in becoming more resilient to economic shocks.

3.4.3 Industrial Policy as a Tool for Addressing Geopolitical Concerns

How is technological competition between US and China altering the nature and objectives of IP (as well as the nature of economic “warfare”)?

US and USSR also competed over technological superiority, but their economies were not intertwined, as is the case between US and China; therefore, the nature of this technological competition and “warfare” will be different.

Since globalization has built interdependencies between countries, it also expected different political economies to follow the same rules since countries are economically and technologically interconnected. However, since different countries have different approaches, it resulted in growing competition between authoritarian and liberal democracies. Therefore, the aim of this category is to understand how this competition has modified the approach to industrial policy. Furthermore, political competition results in technological competition, as is the case of the United States and China. Therefore, the questions aim to examine the influence of technological

competition on industrial policy objectives and its impact on the relationship between the United States and China.

3.4.4 Impact of Industrial Policy on Market Efficiency (Distortions)

- i. Can the positives of IP outweigh its distorting effects on overall efficiency?
- ii. What impact could it have on the private sector?
- iii. How could it affect the direction and scope of globalization (going forward)?
- iv. Could it lead to increased international tensions, even among allies and friends?

This category aims to examine the impact of industrial policy on private-sector operations and how it might distort the market. Moreover, the aim is to understand what the future shape of globalization is going to look like with the implementation of industrial policy.

3.4.5 Thoughts on Biden Administration's Inflation Reduction Act (IRA)

- i. How well does the IRA respond to market failures?
- ii. How well does the IRA respond to political failures?
- iii. What are the potential impacts of the IRA on the private sector?
- iv. What impact will the IRA have on the market?
- v. How might Biden's IRA affect the shape of globalization?

Lastly, this category will focus on a specific industrial policy, Biden's Inflation Reduction Act (IRA), which aims to fight inflation and promote domestic industry and renewable energy production. The aim is to understand the effect of Biden's inflation reduction act on the previously mentioned categories, how this form of industrial policy responds to market and political failures, how it will impact private sector operations, and what effect it will have on the future shape of globalization.

3.5 Data Analysis

The research is based on interviews with experts in the field of industrial policy; therefore, the aim of the data analysis is to look at the arguments of different perspectives and views on each of the categories.

After the data is obtained in the form of Word documents, they are carefully analyzed to get a general sense of the information and to reflect on the overall meaning of the data. According to Creswell, the data needs to be 'winnowed' to narrow it and reconstruct the focus on the critical aspects (2014). Therefore, the next step is to look for general ideas and arguments. Since the topic is complex, the data consists of different viewpoints and arguments that are rather controversial; therefore, the data analysis follows a comprehensive and evaluating approach.

Each response is thoroughly examined, considering the different points of view of each expert. The objective is to identify similarities, differences, and key elements arising from the debate-like character of the interviews by critically evaluating the given responses. The aim of the analysis is to provide a complex understanding of industrial policy and highlight the capabilities and limitations of different perspectives.

3.6 Experts Interviewed

For this research, each expert is carefully chosen for the interview based on their area of research, experience with the topic and respective fields, and their contribution to the field studied, making them authoritative sources whose opinion would have a significant contribution to the research.

The initial respondent was Aiginger, a university professor at the Department of Economics at Vienna University of Economics and Business, and the Head of the Policy Crossover Center in Vienna. His research is specialized in the areas of European strategy and economic policy, climate policy, industrial organization and industrial policy, and Austrian economic policy and economic structure. He has also developed a 'matrix approach,' which combines two different types of industrial policy and explained in his work the development of IP in the European Union (Aiginger & Sieber, 2006).

The next respondent was Crespo Cuaresma, who holds the position of Director of Economic Analysis at the Wittgenstein Centre for Demography and Global Human Capital, a professor at the Vienna University of Economics and Business, and a Research Scholar at the International Institute of Applied Systems Analysis. His areas of expertise have been focused on economic policy, global trends, and economic growth, and one of his articles focused on how industrial policy can be used to facilitate export in advanced industries with an emphasis on research and development (Crespo-Cuaresma & Wörz, 2003).

Sen, an Associate Director and Senior Program Advisor at the London School of Economics, was chosen for the interview as an expert in industrial policy due to his experience and knowledge in policy making and implementation in government. His current professional engagement is highly focused on political and regulatory strategies connected to the government and private sector (Sen, 2004).

Lastly, Coulter, the Head of Industrial Strategy, Skills, and Sustainability at the London School of Economics, was interviewed to get his perspective on the topic since his main research is focused on varieties of capitalism, industrial policy, political economy, and international trade (Calvo & Coulter, 2019).

4 Results

4.1 The Main Motivation for IP in Industrialized Countries

The answers provided by the experts reveal different perspectives on industrial policy as political and economic tools.

4.1.1 IP as a Political Tool

Table 1: IP as a Political Tool

Interviewee	Answers to Category 1, Industrial policy as political tool.
Aiginger	<p>In general we have to distinguish between an old industrial policy, which intervened in the home market, to support specific industries (vertical industrial policy) often distorting markets or to provide general market conditions which should allow firms in all sectors. Left politicians favor the first, liberals the second, US experts often claimed that the best industrial policy would be “no industrial policy”</p> <p>Sometimes in the nineties the two time became mixed first due to the EU which included countries which were more interventionistic type (France) and some more liberal (Germany). (...)</p> <p>At the start of this century globalization became an important issue, industrial policy was now used to prefer the own industry (...). All countries started to use some sort of industrial policy. It should be driven by social and ecological goals (...)</p>
Sen	<p>Trade, outsourcing and outward FDI in developed economies benefits, in the main, the financial services sector and large corporations, which generally mean the better off. Most employment is however in the Small and Medium enterprise sector, which if anything would lose from international trade, and could easily disappear if taken over by larger corporate interests.</p>

	(...) IP is definitely a means of addressing domestic discontent. (...) for this outward looking strategy to work then productivity across the whole economy has to improve dramatically. Most advanced countries failed to invest in doing this and so lost market share to countries like China and other more efficient producers.
Coulter	This depends on the circumstances. Many western countries (Europe and US) used IP in the 70s and 80s to try to preserve sunset industries like shipbuilding from cheaper competition, (...). This became very politicised and was inefficient, as it starved more productive areas of the economy from investment. It led to the common slur: 'picking winners' that is often used to denigrate industrial polies. However, most governments have learned from these mistakes and try to depoliticize IP where possible, for example by placing it in the hands of development agencies or investment banks. But you could argue that it can never be entirely depoliticized as it produces distributive effects that have political outcomes. (...)
Crespo Cuaresma	In a globalized world, the use of IP to protect sectors does not appear as a viable strategy. The costs in terms of foregone welfare that come together with IP of a protective nature by far overcome its potential benefits, and strategies based on compensating the losers of globalization out of the increased economic output resulting of international trade appear more reasonable.

According to Table 1, Coulter highlights that the use of industrial policy as a political tool depends on the circumstances. By referring to the history of industrial policy, when IP was used in the 1970s and 1980s to generate investments in specific sectors, he confirms the statement made by Klimenko regarding the government 'picking winners' (2004). This statement underlines that IP was politicized and rather inefficient. However, Coulter points out that most governments are trying to

depoliticize industrial policy and suggests the involvement of investment banks and development agencies in decision-making. Coulter's insight also matches Rodrik's statement that IP is a process of discovery and learning from past mistakes (2008), adding that IP generates distributive effects that have political outcomes; therefore, it cannot be entirely depoliticized.

Furthermore, Aiginger points out the difference between the use of industrial policy by countries with different philosophical views and uses the term 'matrix approach' to explain how liberal countries like Germany and interventionistic countries like France are implementing industrial policy within the EU. He also underlines the importance of distinguishing the old industrial policy, which is used to intervene in the market and promote certain industries, which supports the statement of Crafts & Hughes (2013) regarding selective industrial policy, adding that this type of IP is favored by left leaning politicians.

Moreover, Sen emphasizes the importance of improving productivity across all sectors of the economy. After the Debt Crisis in the 80s, emerging economies like China were compelled to adopt an investment-dependent export-oriented growth model. Sen points out that many developed countries overlooked the importance of making sufficient investments in enhancing productivity, which resulted in them losing market share to countries like China and other more efficient producers. Furthermore, he draws attention to small and medium enterprises which would experience trade-related detriments and encounter the possibility of acquisition by larger corporate entities, thereby facing the risk of dissolution. Thus, industrial policy is an important tool to address this type of local discontent.

On the contrary, Crespo Cuaresma believes that the use of industrial policy to protect domestic industries is not a feasible solution. He claims that the opportunity costs of foregone welfare due to the implementation of a protectionist industrial policy substantially outweigh the potential benefits it may yield. Consequently, adopting strategies that involve compensating losers of globalization by utilizing the increased economic output resulting from international trade appears to be a more justifiable course of action.

4.1.2 IP as an Economic Tool

Table 2: IP as an Economic Tool

Interviewee	Answers to Category 1, Industrial policy as economic tool.
Aiginger	<p>Industrial policy should change from (insufficient investments in public goods; information asymmetries; basic research, etc.) to (support critical objectives like climate change), (protect strategic sectors, enhance the resilience of the economy) should not used, it is often protectionism in disguise.</p>
Sen	<p>We did research (...) which showed that their investment decisions were based mainly on market size or market access.</p> <p>Basic research (...) supports private sector innovation. Very little basic research is done by the private sector anywhere in the world, and certainly not in the UK or the US. So yes, an effective IP backed by massive investments can work here. (...)</p> <p>(...) a study showed that every single US recovery from an economic crisis was government led. (...) But policy makers see this as an opportunity to stimulate the economy through ‘designer solutions’ that serve several purposes at once. First to achieve green objectives, secondly to create companies that can offer solutions to other countries in the world as well, and thirdly to generate employment. This approach would however only really work in large economies where economies of scale would apply. Korea, Singapore, Switzerland, etc, could not do this unless they had excellent market access conditions to the big markets of the US, China, Japan and the EU, which of course would not happen as those countries would make sure to limit market access.</p>
Coulter	<p>This is the basic ‘market failure’ rationale for IP, which is the least political, as these are relatively easy to determine and treat and the</p>

	<p>effect is usually to increase competition, which is economically beneficial for almost everyone.</p> <p>This is a slightly more ambitious set of IP tools, as it entails taking a view on what the strategic sectors are, which opens policymakers up to political pressure from the winners and losers. However, there is often a very strong case for building up sectors where a country has clear comparative advantage, (...). It's slightly more tricky with completely new sectors, like renewables or hi-tech, as there is no track record of success to guide policymakers. Ditto with 'resilience'. Post-pandemic, there is a new rationale for countries to maintain the ability to produce vaccines and medical protective equipment, and few would dispute the need for this.</p> <p>Climate change has been dubbed the biggest market failure of all time, and there is a wide consensus that the market alone cannot deliver solutions because of sunk costs and widespread coordination failures e.g. moving to new standards for EV battery efficiency, where the advantage lies with 2nd movers – so who wants to go first? This opens up a huge role for government, the main remaining questions being how far intervention goes. Most countries have gone for a combination of supply and demand side measures e.g. banning cars with petrol engines and subsidizing development and purchasing of EVs.</p>
<p>Crespo Cuaresma</p>	<p>To the extent that some climate policies can be interpreted as having IP aspects (CO2 pricing, creating incentives for innovation and greening), IP may still play a relevant role in the portfolio of policies aimed at combating climate change and its negative economic and social effects.</p>

Referring to Table 2, when it comes to the use of industrial policy with respect to investments in public goods, information asymmetries, and basic research, Coulter refers to those market failures as the least political use of IP that aims to increase competition and stimulate economic growth. Furthermore, Sen points out that investment decisions are rather based on market access and market size, which, in the example of Singapore, only serves the privileged. However, Sen underlines that the use of IP in basic research is a necessary tool, especially because it stimulates private-sector innovation.

Regarding IP as a tool to enhance the resilience of the economy, Sen observes that the US has recovered from major economic crises due to the government's massive spending and procurement in specific sectors. Nevertheless, according to Coulter, policymakers are exposed to political pressure from winners and losers; therefore, the country should focus on sectors where they have a comparative advantage, which again confirms Kilmenko's statement (2004). Coulter also adds that it is harder to make decisions regarding emerging sectors since there is no track record of success in directing policymakers. Conversely, Aiginger argues that IP should not be used to support strategic sectors since it is a form of protectionism.

When considering the subject of climate change, it is widely acknowledged among experts that government intervention and the use of industrial policy play a pivotal role in fostering sustainable solutions. Sen outlines that there is a difference between large and small economies. He mentions that industrial policy can help large economies achieve different objectives, such as sustainable goals, offer solutions to other countries, and generate employment. However, it is important to point out that this approach will only work in countries with economies of scale and market access conditions to the big markets, which also supports the argument of Cohen regarding countries benefitting from economies of scale (2006).

Coulter emphasizes that the market cannot generate sustainable solutions due to coordination failures and sunk costs. As Krugman has mentioned, and Coulter supported, there is a role for government intervention when it comes to first and second movers in the market (1987) and would require intervention in combination for a supply and demand side to tackle this market failure.

Even though Crespo Cuaresma and Aiginger have rather critical views on the use of industrial policy, both experts agree on the importance of addressing climate change by implementing the IP. Moreover, Crespo Cuaresma points out that certain climate policies can already be recognized by incorporating an industrial policy framework.

4.2 IP to Prioritize Resilience over Efficiency

Table 3: IP to Prioritize Resilience over Efficiency

Interviewee	Answers to Category 2, IP to prioritize resilience over efficiency
Aiginger	Yes this is important, but resilience needs some cooperation across countries, i.e. gives a role to international organizations like World bank or EU. International cooperation helps, but it is necessary also to include smaller firms. Also it is important to define resilience in an appropriate way, SDG's are not enough.
Sen	<p>(...) The only way for the global economy to do what you are suggesting is to organise international production, transport and consumption systems through the rationing of market access. Very complicated and difficult to enforce. Also, would be anti-competitive (you would need cartels), and inefficient.</p> <p>So generally what we are seeing is large countries launching their own IP without bothering about the effect on other smaller countries. This is naturally causing a huge amount of resentment, particularly against the US which has gone the furthest in this direction.</p>
Coulter	This is a complex area as international supply chains are, by their nature, beyond the ability of national governments to control. Hence the importance of international bodies like the WTO. One possible solution therefore is to 'reshore' or 'nearshore' critical segments of supply chains either back home or to a friendly vicinity. The US with the Made in America' policy and also the EU have been

	doing this to some extent. However, this locks in inefficiency and can actually increase vulnerability as it makes countries reliant on a smaller set of suppliers. Ultimately this is a failure of geopolitics and diplomacy and there is not much that IP can do to ameliorate that.
Crespo Cuaresma	(...) Resilience can also be achieved by diversifying suppliers and expanding markets, with welfare effects which would be higher for the global economy. While certain governments are creating incentives for companies to move production closer to the end customer, I do not believe that a global-level cost-benefit analysis would result in these policies being optimal in terms of fueling innovation and thus (sustainable) economic growth. Recent research supports subsidizing diversification as an optimal policy in the presence of insecure supply chains on theoretical grounds, and in particular finds this policy response to be superior to incentivizing firms to source from closer (and presumably safer) domestic suppliers. (...)

Based on Table 3, the experts have suggested different ways to support international companies and make the national and global economy more resilient to external shocks. According to Sen, to achieve these objectives, it requires the organization of international production, transport, and consumption systems via the implementation of market access rationing. However, this approach raises concerns regarding its potential to hinder competition and result in inefficiency. Furthermore, Aiginger and Coulter underline the need for cooperation across countries and the importance of international organizations such as the World Bank and WTO to build economic resilience. Aiginger points out the imperative of considering small enterprises since they are more vulnerable to economic shocks and providing a comprehensive delineation of resilience.

Crespo Cuaresma emphasizes that resilience can be achieved by diversifying suppliers and expanding markets, referring to the study conducted by Grossman, Helpman, & Lhuillier, previously discussed in this paper (2021). Meantime Aiginger also proposes

‘nearshoring’ and ‘reshoring’ vital segments of the supply chain involving the relocation of business operations either back to the domestic market or to nearby areas that offer favorable economic and logistical conditions.

This approach, however, presents controversial insights among experts. Sen identifies that implementing industrial policy in larger economies might negatively affect smaller countries and bring resentment against large countries, like in the latest example of the US implementing IP. Moreover, Crespo Cuaresma holds the belief that the policies would impede innovation and sustainable economic growth and, according to Coulter, they would reduce efficiency and make countries more vulnerable due to reliance on a smaller number of suppliers. Coulter also points out that industrial policy would be challenging to implement because of the inherent complexities of geopolitics.

4.3 IP as a Tool for Addressing Geopolitical Concerns

Table 4: IP as a Tool for Addressing Geopolitical Concerns

Interviewee	Answers to Category 3, IP as a tool for addressing geopolitical concerns
Aiginger	Technological competition between US and China is different, but the problem is the same. Industrial policy is now defined by China to take the lead in specific sectors, coming from far behind, but leading already today e.g. in the sector of small electric cars. China however uses a lot of coal and nuclear energy, so it will not become a climate neutral economy for a long time. The US needs a lot of intermediate products from China but uses the request for putting attention to product chains to protect its own industry, which is not following climate lead either. IRA is used to subsidize US industries again, a bad example of a hidden industrial policy supporting nationalism.

	<p>The technological competition between US and USSR was concentrated on the military and space sector. Aside from this the countries were never on an equal level.</p>
Sen	<p>US moves against China are of course a form of warfare, as is China's response. But in this case it is not just technological rivalry, but also every other aspect of economic and commercial life. The US dominates the global financial system, including payment and settlement methods, and is leveraging this to their perceived advantage. This together with sanctions, import and export restrictions, and everything else they can think of. China is of course responding.</p> <p>(...) The global economy was not nearly as integrated and intertwined in the period up to the collapse of the USSR. In fact, the WTO only came into existence in 1995, with China joining (at the behest of the US) in 2001. (...) Moreover, trade during the Cold War was mainly in goods and raw materials. Both the US and the USSR had very different markets. Trade in Services and capital decontrol came later for most countries. (...)</p> <p>(..) to look at trade and investment patterns in Europe before the first and second world wars. If I recall correctly, Germany was Britain's biggest trading partner in 1914, and vice versa. (...)</p>
Coulter	<p>Geopolitics and political rivalry has always been an important factor in global trade, as countries have always seen globalization as a 'race to the top' in terms of exploiting new economic opportunities at the technological frontier and leaving lower value-added activities to others. IP in advanced countries was therefore usually about developing the knowledge economy, which meant more R&D and technical training. Now there is a realization that China used the last 30 years to steal intellectual property and gain a</p>

	<p>march on its rivals, while steadily becoming more self-sufficient. However, most of the data shows trade and investment links between China and the rest have slowed, but not gone into reverse, and the rationale of using IP to continually move industry into higher VA activities has not changed much either. In fact, if anything, this has been sharpened as military rivalry makes Western governments even more determined to stay ahead technologically.</p>
<p>Crespo Cuaresma</p>	<p>(...) Notwithstanding potential spillovers related to geopolitics, competition in technology maximizes innovation at the global level and should as such be welcomed. In that respect, IP in a liberal democracy should concentrate on creating the environment that allows innovation to flourish and foster international cooperation in issues related to technology advancement. IP (and in particular, innovation promotion) is just a part of the full package of policies required to provide such an environment, (...). The “advantage” of authoritarian regimes in this topic is related to the possibility of embodying IP in a broader set of strategic geopolitical objectives without the need for democratic legitimation. That makes the design of policies (IP and others) more complicated and less easy to implement in democratic regimes, but that is a price you have to pay when democratic rights are seen as a central building block of the identity of developed nations. In these sense, a deeper international cooperation among democratic countries can serve as an instrument to minimize geopolitical risk. This type of idea has been dubbed “a NATO for trade”, and although a bit naive at the moment, could be the framework in which to think about addressing the problem. Notice again, that nation-level IP has very little leeway to efficiently contribute to solve this problem.</p>

Referring to Table 4, according to Crespo Cuaresma, technological competition fosters innovation on the global level, involving potential geopolitical spillovers; therefore, industrial policy should focus on global collaboration when it comes to technological advancements. He points out that authoritarian regimes have an advantage in incorporating industrial policy within a wider context of strategic geopolitical objectives since democratic regimes require legitimation that characterizes a developed country. A potential alternative would be to create an international cooperation that would focus on minimizing the risks of geopolitics.

However, authoritarian regimes have a different moral framework, according to Foroohar (2022), and Aiginger confirms that statement with the example of China using an extensive amount of coal and nuclear energy, which restricts it from achieving climate neutral economy. Furthermore, Aiginger underlines that the US trying to protect the domestic industries is not following climate change objectives either or conceals IP facilitating nationalism. Moreover, Sen emphasizes that it is not just technological competition between the US and China, but also the US establishing dominance in the global financial system, imposing restrictions and sanctions, while getting a response from China, as a part of economic and commercial parts. This is also supported by the argument of Coulter that globalization has forced countries to compete in global trade and exploit economic opportunities. Consequently, industrial policy was used by industrialized countries to develop a 'knowledge economy' with an emphasis on R&D and skill development. Meantime, Coulter analysis that China has used this opportunity to take advantage of intellectual property, becoming a self-sufficient country that motivated Western countries to strengthen their military to maintain technological superiority.

Regarding the example of the US vs. USSR, the tension is rather built based on military and space industries; nevertheless, the countries were never comparable in terms of technological advancements, states Aiginger. Sen, furthermore, underlines that during the Cold War, despite trade that was mainly based on raw materials and goods, the countries were operating in different markets.

4.4 Impact of IP on Market Efficiency (Distortions)

Table 5: Impact of IP on Market Efficiency (Distortions)

Interviewee	Answers to Category 4, Impact of IP on market efficiency.
Aiginger	<p>IP will impact (private sector), but it does not always work in the future oriented direction. It will in principle dampen globalization. It could (lead to international tensions), if the US favors the own production and Europe answers by similar measures it would, that would be costly and ineffective</p>
Sen	<p>(...) IP works best for larger than smaller economies, and for diversified rather than one-dimensional economies.</p> <p>(...) In spite of all their rhetoric, they hate international competition. Big players in the domestic market can then become bigger, so not so good for smaller private sector players. But they too fear international competition so would probably prefer to just have domestic competition. (...) Most big investment funds want access to international investment prospects and these can only generate high returns if free trade is embedded in the system.</p> <p>Globalisation would go into reverse.</p> <p>(...) It would reduce points of friction and competition, but it would also lead to higher prices for consumers. (...)</p>
Coulter	<p>(...) IP works best for larger than smaller economies, and for diversified rather than one-dimensional economies.</p> <p>(...) In spite of all their rhetoric, they hate international competition. Big players in the domestic market can then become bigger, so not so good for smaller private sector players. But they too fear international competition so would probably prefer to just have domestic competition. (...) Most big investment funds want access</p>

	<p>to international investment prospects and these can only generate high returns if free trade is embedded in the system.</p> <p>Globalization would go into reverse.</p> <p>(...) It would reduce points of friction and competition, but it would also lead to higher prices for consumers. (...)</p>
<p>Crespo Cuaresma</p>	<p>(...) there is a broad understanding (that is for sure the case among academic economists) that the positives of IP are overcome by its distortionary effects. The problems that come together with IP (in particular if it has clear protectionist objectives) are well known: distorting price signals, reduction in competition, negative effects in consumer welfare through higher prices, negative effects in terms of foregone innovation potential, etc, ... Such steps would thus reduce welfare and economic growth globally, which in turn will have negative effects on international geopolitical stability. Integrating IP in climate policy, with objectives related to combat climate change, would however be a reasonable design of a viable future for IP.</p>

Based on Table 5, when it comes to analyzing industrial policy effects on overall efficiency, the opinions of the experts vary. Coulter believes that with present market failures, government intervention in the form of industrial policy works best if it maximizes positive externalities, such as R&D and training, and minimizes distortions, supporting Cohen's statement regarding R&D benefits (2006). Furthermore, Sen adds that the positives of the industrial policy outweigh the distorting effects for diversified, large economies that implement it rather than small, single-dimensional economies.

Aiginger, on the contrary, argues that it is a part of industrial objectives to outweigh the positives of its implementation, but usually, the outcome is the opposite. Furthermore, Crespo Cuaresma argues that industrial policy brings up many concerns, such as the decrease in competitiveness, foregone innovation opportunities, negative

impact on consumer welfare in terms of higher prices, and manipulating price signals, which diminish global economic growth, and distorts international geopolitical stability. Aiginger and Sen both agree that globalization will be weakened, especially if both the US and EU choose domestic production, resulting in higher prices and inefficiency.

Nonetheless, Coulter raises the fact that all countries are implementing IP to a certain extent, which might potentially result in countries advancing in industries where they have a comparative advantage, as Klimenko suggested (2004), resulting in international specialization. Coulter also mentions that a lot of recent focus was on the IP for high-tech industries, which are considered critical industrial sectors.

Furthermore, Sen signifies the benefit industrial policy would bring to the private sector, as they do not have to compete in the global market, which would give larger companies an opportunity to grow, which would have a rather negative impact on smaller enterprises. However, he claims that smaller businesses would still be better off in domestic competition rather than being exposed to the global market. Moreover, he explains that for investors, it would not be a good prospect since the investments are generally done internationally, which would be restricted within the borders. Finally, Crespo Cuaresma mentions that implementing IP with climate change objectives is a sustainable and feasible prospect for future industrial policy.

4.5 Thoughts on Biden Administration’s Inflation Reduction Act

Table 6: Thoughts on Biden Administration’s Inflation Reduction Act

Interviewee	Answers to Category 5, Thoughts on Biden Administration’s Inflation Reduction Act
Aiginger	<p>It does correspond (to market failures), but better should be other measures, a carbon tax, reducing subsidies on fossil energy, (...) insofar as nationalistic goals are set (very old type of IP). It will help US firms and reduce chances of other countries. It will reduce welfare</p> <p>It will change globalization, but it should be designed in cooperation with other western partners and embedded in a social</p>

	<p>an ecological environment, the WTO should accompany the process.</p>
Sen	<p>(...) IRA is not about responding to market failure. It is about the government understanding the need for a transition and being ready to pay for it. If anything, it assumes all the risks that the private sector would never assume left to itself. It is classic dirigisme, backed of course by regulations that restrict imports and huge amounts of government funding.</p> <p>The political failure here is really the failure of the US as a whole to commit and implement any transition to a new economic model. That is a collective problem. So in a way it is the perfect response, but in a way this is not really a political failure. (...)</p> <p>If the whole project is accompanied by a concurrent weakening of Anti-Trust or Competition rules, which seems likely, then there will be less competition and so products will be of poorer quality and lower standards. By and large consumers won't notice because they won't have anything to compare it with.</p> <p>(...) globalisation would not just go into reverse but the process itself would disintegrate entirely. If this continues for some time - say 20-30 years - then each country will set its own regulations and standards and these will increasingly diverge over the long term. It will be hugely difficult to restart the globalisation engine.</p>
Coulter	<p>IRA is an extremely complex set of IP tools that has a clear set of missions (decarbonization, resilience, jobs etc) and uses the full set of tools (subsidies, regulation, tax incentives). It also includes a demand-side element (public procurement) and sets out end to end business models for firms e.g. in renewable energy sectors that</p>

	<p>the government will support, to give firms the confidence to invest as they can be reasonably sure of a final market.</p> <p>It seems to have been politically very successful, as even Republicans support IP these days, (...)</p> <p>It involves huge sums of money, which will galvanise the private sector and probably crowd in a lot of private sector investment. There will also be a lot of waste of course – corruption, deadweight costs etc. But overall, it will stimulate the economy and give the US competitive advantages in renewables. One problem is that there are parts of the economy, e.g. the power grid, that are not well set up to cope with the likely surge in renewable energy, so this will hold things up.</p> <p>(...)</p> <p>The IRA will have a big effect on globalization. It is billed as a response to geopolitical concerns over China, and by reshoring many industries it will tend to loosen some linkages. It will also draw a response from other countries and blocs, like the EU which is drawing up its own green IP plans to subsidise EVs and renewables. There are many positives though. e.g. the technological spillovers from the investment will be immense, and will help other countries develop their green industries.</p>
<p>Crespo Cuaresma</p>	<p>(...)</p>

According to Table 6, to start off, Inflation Reduction Act is a complex set of industrial policy tools, according to Coulter, which involves demand-side elements, a clear set of missions it tries to accomplish, and proposes a business framework for enterprises that receive governmental support. However, Sen believes that it is not about responding to market failures but rather about recognizing the need for

transformation and demonstrating the willingness to endure its costs as it requires big amounts of government funding.

The opinion of the experts was very diverse regarding IRA's response to political failures. While Sen explained that it is rather a failure of the US to carry out a transition to a new economic model, Coulter claims that the Inflation Reduction Act seems to be successful, as Republicans are also supporting its implementation. Nonetheless, Aiginger argues that the old type of industrial policy is used, which involves nationalistic motives.

The private sector will be able to operate without international competition, according to Sen, which is more likely to result in a quality decline and lower standards as consumers would not be able to compare the goods, which has also been mentioned in the argument of Magill & Shafer (1991). Therefore, Aiginger points out that it will reduce consumer welfare and, according to Coulter, might lead to corruption, access costs, etc, but would give the US a comparative advantage in green industry, and renewable energy, in particular.

All the experts agree that the shape of globalization will change, and IRA will have a big impact on that. First, Coulter points out that the IRA was created in response to geopolitical tensions with China, which also resulted in responses from other countries' implementation of their own form of industrial policies. Sen believes that if every country continues to implement IP further, it would be very hard to bring back open trade and globalization. Therefore, Aiginger believes that the policies should be designed in cooperation with Western countries in a socioeconomic system, with the support of organizations like WTO. Coulter also highlights potential technological spillovers which would help countries develop their green industries.

4.6 Research Process and Observations

The research is subject to limitations that arose during the data collection. Given that expert interviews are the method of primary data collection for this research, it was critical to choose people with substantial knowledge and experience in the field of industrial policy. However, as the experts occupy the roles of policymakers, researchers, professors, and equivalent positions, their schedules are considerably

demanding. A total of 178 experts were contacted during the process of data collection, with many rejections being received due to their busy schedules. Some experts, however, recognized the significance of the topic and expressed best wishes in the research.

Furthermore, another limitation occurred due to the geographic location of the experts. The individuals that participated in the research are based in Austria or England. It would have also been favorable to incorporate insights from experts based in other countries, particularly in the US since the research is also focusing on the implementation of the Inflation Reduction Act implemented by Joe Biden's Administration.

The topic of industrial policy can be further elaborated in future research, considering the change in economic order by increased government intervention in the United States and apparent shifts in the global supply chains. Therefore, future research could analyze more extensively the consequences of these developments. Moreover, it is evident that the WTO also needs to adapt to the changing global order; therefore, future research could analyze how WTO would need to adjust its policies and governance to align with emerging economic changes. Furthermore, the present research only focuses on industrialized countries and has not analyzed the effects of industrial policy on developing economies. Consequently, future research could elaborate on the use of industrial policy in developing countries and its potential to facilitate the transition of informal sectors into formalized structures.

5 Conclusion

This research was based on five main topics, the main motivation for industrial policy in industrialized countries, industrial policy to prioritize resilience over efficiency, industrial policy as a tool for addressing geopolitical concerns, the impact of industrial policy on market efficiency/distortions, and thoughts on Biden Administration's Inflation Reduction Act. A semi-structured, open-ended interview was conducted with the experts in the field of industrial policy to gain a deeper insight into the topic.

During the data analysis process, it became evident that the opinions of the experts varied widely and sometimes contradicted each other regarding the implementation of industrial policy. An assumption is made that the responses and opinions potentially differ due to their respective research areas, their respective political positions regarding the role of government and, perhaps, the economic situation of the countries in which they operate.

The disagreement between experts emerges when it comes to the use of industrial policy as a tool to enhance resilience towards economic shocks. Coulter emphasizes the government's attempt to depoliticize industrial policy and highlights that the country should focus on sectors where they have a comparative advantage. Furthermore, Sen mentions that industrial policy is an important tool to address this type of domestic discontent. On the contrary, Crespo Cuaresma argues against the use of industrial policy to protect domestic industries as the opportunity costs of foregone welfare significantly outweigh the potential benefits it may deliver. Aiginger shares Crespo Cuaresma's perspective, mentioning that industrial policy should not be used to support strategic sectors since it is a form of protectionism.

Another point of disagreement is recognized in the experts' opinions on the Inflation Reduction Act response to political failures. Sen argues that it is The US's failure to transition to a new economic model, Coulter contends that the Inflation Reduction Act seems to be successful, as its implementation receives support even from Republicans. However, Aiginger points out that the old type of industrial policy is used, which is driven by nationalistic motives.

Nevertheless, one notable point of agreement among the experts, regardless of their opinions on other aspects, is the recognition of the implication of industrial policy as a strategy to address climate change and foster the growth of green industries. Another remarkable argument is related to the importance of public investment in basic scientific research to generate positive externalities and stimulate innovation.

Regarding the remaining aspects, it can be concluded from the opinions that industrial policy is a complex set of tools the implementation of which depends on different criteria, such as political factors and the size and economic position of the country, as well as their relation to geopolitics factors. Furthermore, the importance of small and medium enterprises (SMEs), which could constitute the backbone of many economies, was highlighted. Decision-making processes need to specifically address their situation, given their increased vulnerability to economic shocks and increased chances of being compelled to exit the market when forced to compete in an open economy.

The shape of globalization will be changed as the countries focus on their own industries' development and the Inflation Reduction Act will be one of the means to facilitate that. However, the experts suggest that it requires the cooperation of countries and international organizations to achieve a successful implementation of IP and allow potential technological spillovers to stimulate sustainable development and growth.

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Appendices

Bachelor Thesis - Industrial Policy Options for a Post-pandemic Global Economy

Interview Questionnaire

By continuing to answer the questions, you agree that the data from your responses will be stored for research purposes and that you wish to participate in this study.

*Please give your answers/thoughts/comments on the following **categories**.*

All your answers will be used for academic purposes only.

The answers can be provided in any written or spoken form.

Appendix 1 Prof. Aiginger

1. The main motivation for IP in industrialized countries:

- iii. Trade, outsourcing, and outward FDI have created winner and loser groups within developed economies. To what extent is IP (Industrial policy) a **political tool** to dampen domestic discontent through protection and support (rather than try to deal with the issue through other means like redistribution, retraining, etc.)
- iv. To what extent is IP an **economic tool** to address the following market failures:
 - a. insufficient investments in public goods; information asymmetries; basic research, etc.;
 - b. protect strategic sectors, enhance the resilience of the economy;
 - c. support critical objectives like climate change (this could be both a market failure due to ineffective costing of environmental costs and a political failure)

Your answer:

Ad I : in general we have to distinguish between an old industrial policy, which intervened in the home market, to support specific industries (vertical industrial policy) ofte distorting markets or to provide general market conditions which should allow firms in all sectors. Left politicians favor the first, liberals the second, US experts often claimed that the best industrial policy would be “no industrial policy” Sometimes in the nineties the two time became mixed first due to the EU which included countries which were more interventionistic type (France) and some more liberal (Germany). Aiginger Sieber used the term “matrix approach” for this change. At the start of this century globalization became an important issue, industrial policy was now used to prefer the own industry (better industries, since the border between manufacturing and high value-added services became less stringent). All countries started to use some sort of industrial policy. It should be driven by social and ecological goals was claimed by Aiginger, Rodrik 2020

Ad II: what was said under I answer this question. Industrial policy should change from a) to c),
b) should not used, it is often protectionism in disguise

2. IP to prioritize resilience over efficiency:

How can IP be crafted to make the national economy (and global economy) more resilient to external shocks by supporting international companies to build resilience into their supply chains?

Your answer:

Yes this is important, but resilience needs some cooperation across countries, i.e. gives a role to international organizations like World bank or EU. International cooperation helps, but it is necessary also to include smaller firms. Also it is important to define resilience in an appropriate way, SDG's are not enough

3. IP as a tool for addressing geopolitical concerns:

How is technological competition between US and China altering the nature and objectives of IP (as well as the nature of economic "warfare")?
US and USSR also competed over technological superiority, but their economies were not intertwined, as is the case between US and China; therefore, the nature of this technological competition and "warfare" will be different.

Your answer:

Technological competition between US and China is different, but the problem is the same. Industrial policy is now defined by China to take the lead in specific sectors, coming from far behind, but leading already today e.g. in the sector of small electric cars. China however uses a lot of coal and nuclear energy, so it will not become a climate neutral economy for a long time. The US needs a lot of intermediate products from China but uses the request for putting attention to product chains to protect its own industry, which is not following climate lead either. IRA is used to subsidize US industries again, a bad example of a hidden industrial policy supporting nationalism.

The technological competition between US and USSR was concentrated on the military and space sector. Aside from this the countries were never on an equal level.

4. Impact of IP on market efficiency (distortions):

- v. Can the positives of IP outweigh its distorting effects on overall efficiency?
- vi. What impact could it have on the private sector?
- vii. How could it affect the direction and scope of globalization (going forward)?
- viii. Could it lead to increased international tensions, even among allies and friends?

Your answer:

- i. It could and it should, but usually does not

- ii. IP will impact, but it does not always work in the future oriented direction
- iii. It will in principle dampen globalization
- iv. Yes it could, if the US favors the own production and Europe answers by similar measures it would, that would be costly and ineffective

5. Thoughts on Biden Administration's Inflation Reduction Act (IRA):

- vi. How well does the IRA respond to market failures?
- vii. How well does the IRA respond to political failures?
- viii. What are the potential impacts of the IRA on the private sector?
- ix. What impact will the IRA have on the market?
- x. How might Biden's IRA affect the shape of globalization?

Your answer:

- i. it does correspond, but better should be other measures, a carbon tax, reducing subsidies on fossil energy,
- ii. Not at all – insofar as nationalistic goals are set (very old type of IP)
- iii. It will help US firms and reduce chances of other countries
- iv. It will reduce welfare
- v. It will change globalization, but it should be designed in cooperation with other western partners and embedded in a social and ecological environment, the WTO should accompany the process

Appendix 2 Prof. Sen

1. The main motivation for IP in industrialized countries:

- i. Trade, outsourcing, and outward FDI have created winner and loser groups within developed economies. To what extent is IP (Industrial policy) a **political tool** to dampen domestic discontent through protection and support (rather than try to deal with the issue through other means like redistribution, retraining, etc.)
- ii. To what extent is IP an **economic tool** to address the following market failures:
 - a. insufficient investments in public goods; information asymmetries; basic research, etc.;
 - b. protect strategic sectors, enhance the resilience of the economy;
 - c. support critical objectives like climate change (this could be both a market failure due to ineffective costing of environmental costs and a political failure)

Your answer:

- i. Trade, outsourcing, and outward FDI have created winner and loser groups within developed economies. To what extent is IP (Industrial policy) a **political tool** to dampen domestic discontent through protection and

support (rather than try to deal with the issue through other means like redistribution, retraining, etc.). Trade, outsourcing and outward FDI in developed economies benefits, in the main, the financial services sector and large corporations, which generally mean the better off. Most employment is however in the Small and Medium enterprise sector, which if anything would lose from international trade, and could easily disappear if taken over by larger corporate interests.

So yes, IP is definitely a means of addressing domestic discontent. But one must also bear in mind, that for this outward looking strategy to work then productivity across the whole economy has to improve dramatically. Most advanced countries failed to invest in doing this and so lost market share to countries like China and other more efficient producers. The irony here of course is that many of these emerging economies were more or less forced (in the aftermath of the Debt Crisis of the 1980s) to liberalise and adopt an investment dependent-export oriented growth model. It was not really their choice.

- ii. To what extent is IP an **economic tool** to address the following market failures:
 - a. insufficient investments in public goods; information asymmetries; basic research, etc.;;

We did research (for the Pharmaceutical sector) which showed that their investment decisions were based mainly on market size or market access. Thus Singapore got a lot of Pharmaceutical company investment because they had trade agreements with the US, China, the EU and others. So market access was the key issue here. Singapore's IP was designed specifically to do this with three sectors in mind: oil and gas processing, financial services and pharmaceuticals. Interestingly, most of Singapore's assets (land, ports, airlines etc, are government owned, so a common complaint is that the 'government is rich, but we are not'. So this is perhaps an example of an IP strategy that serves only the rich and privileged in Singapore, which is very true if you visit.

Basic research (invariably at government expense) actually supports private sector innovation. Very little basic research is done by the private sector anywhere in the world, and certainly not in the UK or the US. So yes, an effective IP backed by massive investments can work here.
 - b. protect strategic sectors, enhance the resilience of the economy;

Yes, this of course is the main reason for an IP. In fact if you consider the history of Germany or the US, or indeed the UK immediately after the war, this was the objective, together with the need to

stimulate growth. It has now come back with renewed strength because of the green agenda in both the US and to a lesser extent in the EU.

I don't have the reference to hand, but a few years ago a study showed that every single US recovery from an economic crisis was government led. Of course this doesn't mean through an IP necessarily, but for example the US only really recovered from the Crash of 1929 with massive government spending, and massive government procurement, on war time requirements including weapons, planes, ships, etc.

- c. support critical objectives like climate change (this could be both a market failure due to ineffective costing of environmental costs and a political failure)

Yes I would agree with this. But policy makers see this as an opportunity to stimulate the economy through 'designer solutions' that serve several purposes at once. First to achieve green objectives, secondly to create companies that can offer solutions to other countries in the world as well, and thirdly to generate employment. This approach would however only really work in large economies where economies of scale would apply. Korea, Singapore, Switzerland, etc, could not do this unless they had excellent market access conditions to the big markets of the US, China, Japan and the EU, which of course would not happen as those countries would make sure to limit market access.

2. IP to prioritize resilience over efficiency:

How can IP be crafted to make the national economy (and global economy) more resilient to external shocks by supporting international companies to build resilience into their supply chains?

Your answer:

How can IP be crafted to make the national economy (and global economy) more resilient to external shocks by supporting international companies to build resilience into their supply chains?

Good question. Am not sure that this is possible. Why would other countries cooperate with the IP of a major trading partner? They would certainly want something in return, perhaps in a sector that is important to them. Perhaps you could look at the history of the post war Iron and Steel Community in the EU which was built around the IP of both France and Germany. France would export coal (and later agricultural products) to Germany, while Germany would export engineering

products to France. This measure became the foundation for European integration so may be worth studying.

The only way for the global economy to do what you are suggesting is to organise international production, transport and consumption systems through the rationing of market access. Very complicated and difficult to enforce. Also, would be anti-competitive (you would need cartels), and inefficient.

So generally what we are seeing is large countries launching their own IP without bothering about the effect on other smaller countries. This is naturally causing a huge amount of resentment, particularly against the US which has gone the furthest in this direction.

3. IP as a tool for addressing geopolitical concerns:

How is technological competition between US and China altering the nature and objectives of IP (as well as the nature of economic “warfare”)?
US and USSR also competed over technological superiority, but their economies were not intertwined, as is the case between US and China; therefore, the nature of this technological competition and “warfare” will be different.

Your answer:

How is technological competition between US and China altering the nature and objectives of IP (as well as the nature of economic “warfare”)?

US moves against China are of course a form of warfare, as is China’s response. But in this case it is not just technological rivalry, but also every other aspect of economic and commercial life. The US dominates the global financial system, including payment and settlement methods, and is leveraging this to their perceived advantage. This together with sanctions, import and export restrictions, and everything else they can think of. China is of course responding.

US and USSR also competed over technological superiority, but their economies were not intertwined, as is the case between US and China; therefore, the nature of this technological competition and “warfare” will be different.

Yes, you are probably right. But perhaps not that different. The global economy was not nearly as integrated and intertwined in the period up to the collapse of the USSR. In fact, the WTO only came into existence in 1995, with China joining (at the behest of the US) in 2001. So these are two very different episodes in history. Moreover, trade during the Cold War was mainly in goods and raw materials. Both the US and the USSR had very different markets. Trade in Services and capital decontrol came later for most countries. So yes, very different.

Perhaps a better example would be to look at trade and investment patterns in Europe before the first and second world wars. If I recall correctly, Germany was

Britain's biggest trading partner in 1914, and vice versa. So too with investments. But they still managed to find a reason to fight!

4. Impact of IP on market efficiency (distortions):

- i. Can the positives of IP outweigh its distorting effects on overall efficiency?
- ii. What impact could it have on the private sector?
- iii. How could it affect the direction and scope of globalization (going forward)?
- iv. Could it lead to increased international tensions, even among allies and friends?

Your answer:

- i. Can the positives of IP outweigh its distorting effects on overall efficiency?
Definitely yes for the countries involved. But IP works best for larger than smaller economies, and for diversified rather than one-dimensional economies.
- ii. What impact could it have on the private sector?
Dream come true for the private sector. In spite of all their rhetoric, they hate international competition. Big players in the domestic market can then become bigger, so not so good for smaller private sector players. But they too fear international competition so would probably prefer to just have domestic competition.

But for investors, it would not be great news. Most big investment funds want access to international investment prospects and these can only generate high returns if free trade is embedded in the system.

- iii. How could it affect the direction and scope of globalization (going forward)?
Globalisation would go into reverse.
- iv. Could it lead to increased international tensions, even among allies and friends?
Not necessarily. It would reduce points of friction and competition, but it would also lead to higher prices for consumers. Wages would also rise (in theory) so that would be popular.

5. Thoughts on Biden Administration's Inflation Reduction Act (IRA):

- i. How well does the IRA respond to market failures?
- ii. How well does the IRA respond to political failures?
- iii. What are the potential impacts of the IRA on the private sector?
- iv. What impact will the IRA have on the market?
- v. How might Biden's IRA affect the shape of globalization?

Your answer:

- i. How well does the IRA respond to market failures?
I think it is important to realise that the IRA is not about responding to market failure. It is about the government understanding the need for a transition and being ready to pay for it. If anything, it assumes all the risks that the private sector would never assume left to itself. It is classic dirigisme, backed of course by regulations that restrict imports and huge amounts of government funding.
- ii. How well does the IRA respond to political failures?
The political failure here is really the failure of the US as a whole to commit and implement any transition to a new economic model. That is a collective problem. So in a way it is the perfect response, but in a way this is not really a political failure.
- iii. What are the potential impacts of the IRA on the private sector?
Existing entities would be licking their lips at juicy government contracts, and being able to operate free from international competition. Investors would however think differently.
- iv. What impact will the IRA have on the market?
It depends. If the whole project is accompanied by a concurrent weakening of Anti-Trust or Competition rules, which seems likely, then there will be less competition and so products will be of poorer quality and lower standards. By and large consumers won't notice because they won't have anything to compare it with.
- v. How might Biden's IRA affect the shape of globalization?
As with everything the US does, if it works for them they won't bother about others. The EU is not big enough on its own to change things, unless they join with China and Japan, which is highly unlikely. So globalisation would not just go into reverse but the process itself would disintegrate entirely. If this continues for some time - say 20-30 years - then each country will set its own regulations and standards and these will increasingly diverge over the long term. It will be hugely difficult to restart the globalisation engine.

Appendix 3 Prof. Coulter

1. The main motivation for IP in industrialized countries:

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| <ol style="list-style-type: none">iii. Trade, outsourcing, and outward FDI have created winner and loser groups within developed economies. To what extent is IP (Industrial policy) a political tool to dampen domestic discontent through protection and support (rather than try to deal with the issue through other means like redistribution, retraining, etc.)iv. To what extent is IP an economic tool to address the following market failures: |
|---|

- a. insufficient investments in public goods; information asymmetries; basic research, etc.;
- b. protect strategic sectors, enhance the resilience of the economy;
- c. support critical objectives like climate change (this could be both a market failure due to ineffective costing of environmental costs and a political failure)

Your answer:

i. This depends on the circumstances. Many western countries (Europe and US) used IP in the 70s and 80s to try to preserve sunset industries like shipbuilding from cheaper competition, as they stood to lose a lot of skilled jobs in areas with few economic alternatives. This became very politicised and was inefficient, as it starved more productive areas of the economy from investment. It led to the common slur: 'picking winners' that is often used to denigrate industrial polities. However, most governments have learned from these mistakes and try to depoliticize IP where possible, for example by placing it in the hands of development agencies or investment banks. But you could argue that it can never be entirely depoliticized as it produces distributive effects that have political outcomes. I should add, though, that automation has had a larger effect on jobs than globalization (Acemoglu estimates by a ratio of 3 to 1 in the US).

- ii. 1. This is the basic 'market failure' rationale for IP, which is the least political, as these are relatively easy to determine and treat and the effect is usually to increase competition, which is economically beneficial for almost everyone.
2. This is a slightly more ambitious set of IP tools, as it entails taking a view on what the strategic sectors are, which opens policymakers up to political pressure from the winners and losers. However, there is often a very strong case for building up sectors where a country has clear comparative advantage, e.g. the German auto industry, biotech in the US. It's slightly more tricky with completely new sectors, like renewables or hi-tech, as there is no track record of success to guide policymakers. Ditto with 'resilience'. Post-pandemic, there is a new rationale for countries to maintain the ability to produce vaccines and medical protective equipment, and few would dispute the need for this.
3. Climate change has been dubbed the biggest market failure of all time, and there is a wide consensus that the market alone cannot deliver solutions because of sunk costs and widespread coordination failures e.g. moving to new standards for EV battery efficiency, where the advantage lies with 2nd movers – so who wants to go first? This opens up a huge role for government, the main remaining questions being how far intervention goes. Most countries have gone for a combination of supply and demand side measures e.g. banning cars with petrol engines and subsidizing development and purchasing of EVs.

2. IP to prioritize resilience over efficiency:

How can IP be crafted to make the national economy (and global economy) more resilient to external shocks by supporting international companies to build resilience into their supply chains?

Your answer:

This is a complex area as international supply chains are, by their nature, beyond the ability of national governments to control. Hence the importance of international bodies like the WTO. One possible solution therefore is to 'reshore' or 'nearshore' critical segments of supply chains either back home or to a friendly vicinity. The US with the 'Made in America' policy and also the EU have been doing this to some extent. However, this locks in inefficiency and can actually increase vulnerability as it makes countries reliant on a smaller set of suppliers. Ultimately this is a failure of geopolitics and diplomacy and there is not much that IP can do to ameliorate that.

3. IP as a tool for addressing geopolitical concerns:

How is technological competition between US and China altering the nature and objectives of IP (as well as the nature of economic "warfare")?
US and USSR also competed over technological superiority, but their economies were not intertwined, as is the case between US and China; therefore, the nature of this technological competition and "warfare" will be different.

Your answer:

Geopolitics and political rivalry has always been an important factor in global trade, as countries have always seen globalization as a 'race to the top' in terms of exploiting new economic opportunities at the technological frontier and leaving lower value-added activities to others. IP in advanced countries was therefore usually about developing the knowledge economy, which meant more R&D and technical training. Now there is a realization that China used the last 30 years to steal intellectual property and gain a march on its rivals, while steadily becoming more self-sufficient. However, most of the data shows trade and investment links between China and the rest have slowed, but not gone into reverse, and the rationale of using IP to continually move industry into higher VA activities has not changed much either. In fact, if anything, this has been sharpened as military rivalry makes Western governments even more determined to stay ahead technologically.

4. Impact of IP on market efficiency (distortions):

- v. Can the positives of IP outweigh its distorting effects on overall efficiency?
- vi. What impact could it have on the private sector?
- vii. How could it affect the direction and scope of globalization (going forward)?
- viii. Could it lead to increased international tensions, even among allies and friends?

Your answer:

- i. This depends on the context, but most policymakers who aren't free-market obsessives agree that the sheer range of market failures makes intervention by reasonably competent governments a net positive. Generally, IP works best when it maximises the positive externalities of firms activities, e.g. R&D and training, where there are many useful spillovers, and minimizes distortions e.g. heavy subsidies based on vague hunches. A lot of recent IP has been focused on the most productive sectors of the economy e.g. high-tech, where coordination and holdup problems are greatest. In these cases, the risk of not doing something (missing out on important new industrial sectors) is greater than not doing it (backing losers).
- ii. (see above)
- iii. As all countries practice IP (whether they admit to doing it or not), the effect on globalization is probably to enhance the effects of international specialization i.e. countries supporting what they are good at.
- iv. (see below)

5. Thoughts on Biden Administration's Inflation Reduction Act (IRA):

- vi. How well does the IRA respond to market failures?
- vii. How well does the IRA respond to political failures?
- viii. What are the potential impacts of the IRA on the private sector?
- ix. What impact will the IRA have on the market?
- x. How might Biden's IRA affect the shape of globalization?

Your answer:

- i. IRA is an extremely complex set of IP tools that has a clear set of missions (decarbonization, resilience, jobs etc) and uses the full set of tools (subsidies, regulation, tax incentives). It also includes a demand-side element (public procurement) and sets out end to end business models for firms e.g. in renewable energy sectors that the government will support, to give firms the confidence to invest as they can be reasonably sure of a final market.
- ii. It seems to have been politically very successful, as even Republicans support IP these days, and its 'buy America' strictures play well in deindustrialized regions.
- iii. It involves huge sums of money, which will galvanise the private sector and probably crowd in a lot of private sector investment. There will also be a lot of waste of course – corruption, deadweight costs etc. But overall, it will stimulate the economy and give the US competitive advantages in renewables. One problem is that there are parts of the economy, e.g. the power grid, that are not well set up to cope with the likely surge in renewable energy, so this will hold things up.
- iv. (not sure what you meant by the market, so have tried to cover this in the Q above)
- v. The IRA will have a big effect on globalization. It is billed as a response to geopolitical concerns over China, and by reshoring many industries it will tend to loosen some linkages. It will also draw a response from other countries and blocs, like the EU which is drawing up its own green IP plans to subsidise EVs and renewables. There are many positives though. e.g. the technological spillovers from

the investment will be immense, and will help other countries develop their green industries.

Appendix 4 Prof. Crespo Cuaresma

1. The main motivation for IP in industrialized countries:

- v. Trade, outsourcing, and outward FDI have created winner and loser groups within developed economies. To what extent is IP (Industrial policy) a **political tool** to dampen domestic discontent through protection and support (rather than try to deal with the issue through other means like redistribution, retraining, etc.)
- vi. To what extent is IP an **economic tool** to address the following market failures:
 - a. insufficient investments in public goods; information asymmetries; basic research, etc.;
 - b. protect strategic sectors, enhance the resilience of the economy;
 - c. support critical objectives like climate change (this could be both a market failure due to ineffective costing of environmental costs and a political failure)

Your answer:

In a globalized world, the use of IP to protect sectors does not appear as a viable strategy. The costs in terms of foregone welfare that come together with IP of a protective nature by far overcome its potential benefits, and strategies based on compensating the losers of globalization out of the increased economic output resulting of international trade appear more reasonable. To the extent that some climate policies can be interpreted as having IP aspects (CO2 pricing, creating incentives for innovation and greening), IP may still play a relevant role in the portfolio of policies aimed at combating climate change and its negative economic and social effects.

2. IP to prioritize resilience over efficiency:

How can IP be crafted to make the national economy (and global economy) more resilient to external shocks by supporting international companies to build resilience into their supply chains?

Your answer:

I reject the interpretation of resilience as a move towards regionalization and (pseudo)protectionism in a modern, open and globalized world. Resilience can also be achieved by diversifying suppliers and expanding markets, with welfare effects which would be higher for the global economy. While certain governments are creating incentives for companies to move production closer to the end customer, I do not believe that a global-level cost-benefit analysis would result in these policies being optimal in terms of fueling innovation and thus (sustainable) economic growth. Recent research supports subsidizing diversification as an optimal policy in

the presence of insecure supply chains on theoretical grounds, and in particular finds this policy response to be superior to incentivizing firms to source from closer (and presumably safer) domestic suppliers. Here you have the study I am referring to: <https://www.nber.org/papers/w29330>

3. IP as a tool for addressing geopolitical concerns:

How is technological competition between US and China altering the nature and objectives of IP (as well as the nature of economic “warfare”)?

US and USSR also competed over technological superiority, but their economies were not intertwined, as is the case between US and China; therefore, the nature of this technological competition and “warfare” will be different.

Your answer:

Unfortunately, I am not an expert in political science or international relations, so I will concentrate on the effects related to technological innovation and adoption. Notwithstanding potential spillovers related to geopolitics, competition in technology maximizes innovation at the global level and should as such be welcomed. In that respect, IP in a liberal democracy should concentrate on creating the environment that allows innovation to flourish and foster international cooperation in issues related to technology advancement. IP (and in particular, innovation promotion) is just a part of the full package of policies required to provide such an environment, which includes for instance education, migration and trade policy. The “advantage” of authoritarian regimes in this topic is related to the possibility of embodying IP in a broader set of strategic geopolitical objectives without the need for democratic legitimation. That makes the design of policies (IP and others) more complicated and less easy to implement in democratic regimes, but that is a price you have to pay when democratic rights are seen as a central building block of the identity of developed nations. In these sense, a deeper international cooperation among democratic countries can serve as an instrument to minimize geopolitical risk. This type of idea has been dubbed “a NATO for trade”, and although a bit naive at the moment, could be the framework in which to think about addressing the problem. Notice again, that nation-level IP has very little leeway to efficiently contribute to solve this problem.

4. Impact of IP on market efficiency (distortions):

- ix. Can the positives of IP outweigh its distorting effects on overall efficiency?
- x. What impact could it have on the private sector?
- xi. How could it affect the direction and scope of globalization (going forward)?
- xii. Could it lead to increased international tensions, even among allies and friends?

Your answer:

The first question is impossible to answer without going into detailed cost-benefit analyses of particular IP strategies. The fact that IP has become a pretty irrelevant

instrument over the last decades, in parallel to increasing globalization trends, indicated that there is a broad understanding (that is for sure the case among academic economists) that the positives of IP are overcome by its distortionary effects. The problems that come together with IP (in particular if it has clear protectionist objectives) are well known: distorting price signals, reduction in competition, negative effects in consumer welfare through higher prices, negative effects in terms of foregone innovation potential, etc, ... Such steps would thus reduce welfare and economic growth globally, which in turn will have negative effects on international geopolitical stability. Integrating IP in climate policy, with objectives related to combat climate change, would however be a reasonable design of a viable future for IP.