

19-4 The Return of Economic Nationalism in Germany

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The recent embrace of economic nationalism by the United States, China, and many other countries reflects a global shift toward protectionism, restrictions on foreign investment, and aggressive state intervention in domestic economies. These policies are not new—they were invented by today’s industrial world in the 18th and 19th centuries, ran wild in the 1930s, were widely applied in developing countries since the 1940s, and have enjoyed new popularity in the aftermath of the Great Recession. Germany, however, seemed to be an exception—influenced perhaps by its postwar ordoliberal tradition, its dependence on international trade, and a strong political commitment to multilateralism.

Germany’s new National Industrial Strategy 2030, unveiled by Economy Minister Peter Altmaier in February 2019, upends that view (Altmaier 2019). To the shock of many German commentators, particularly on the center-right, the

document advocates an aggressive industrial policy.¹ And although it stays clear of the virulent economic nationalism of the 1930s and the protectionism of US President Donald Trump, its tone and much of its content are unmistakably nationalist (in either a German or an EU sense). Specifically, Altmaier calls for

- raising the manufacturing share in GDP both in Germany (from the current 23 percent—twice the share of France or the United States—to 25 percent) and in the European Union (from 14 to 20 percent),
- closing EU value chains to imports from outside the European Union,
- designating specific German firms as “national champions,”
- modifying EU competition law to facilitate the creation of EU champions, even when this hurts competition in the European Union,
- allowing the German state to buy shares of companies in order to prevent foreign takeovers, and
- extensive state support of industrial sectors of “great economic significance.”

1. See “Altmaiers schlechte Ideen,” *Frankfurter Allgemeine Zeitung*, February 1, 2016, www.faz.net/aktuell/wirtschaft/altmaiers-industriepolitische-ideen-sind-schlecht-16020104.html; “Altmaier’s Industriepolitik ist ein Strategiewechsel in die falsche Richtung,” *Die Welt*, February 6, 2016, www.welt.de/wirtschaft/article188363821/Wirtschaftsweise-Altmaiers-Industriepolitik-ist-ein-Strategiewechsel-in-die-falsche-Richtung.html; “Finger weg von der Planwirtschaft,” *Süddeutsche Zeitung*, February 8, 2018, www.sueddeutsche.de/wirtschaft/kommentar-finger-weg-von-der-planwirtschaft-1.4322163; and “Keine Industriepolitik, sondern Markt und Wettbewerb!,” *Frankfurter Allgemeine Zeitung*, February 27, 2018, www.faz.net/aktuell/politik/inland/norbert-roettgen-plaedierte-fuer-markt-und-wettbewerb-16063448.html. Reactions on the left have been more nuanced, with some observers criticizing the nationalist tone of the document but supporting the call for more intervention. See “Jetzt wird wieder in die Hände gespuckt,” *Die Zeit*, February 6, 2019, www.zeit.de/2019/07/industriepolitik-bundesregierung-schutz-konzerne-china-amerika-peter-altmaier; “Made in Germany Great Again,” *taz.Die Tageszeitung*, February 6, 2019, www.taz.de/!5567490/; and “Ich zuerst,” *Die Zeit*, February 13, 2019, www.zeit.de/2019/08/multilateralismus-handelspolitik-kooperation-populismus-nationalismus.

This Policy Brief describes Altmaier’s main proposals, puts them in historical context, and analyzes their economic merits. It concludes that three of the proposals—attempting to further raise the German share of manufacturing, restricting non-EU imports of intermediate goods, and promoting national champions in Germany and the European Union—are bad policy, even based on a narrow reading of Germany’s and the European Union’s self-interest. The two remaining ideas—preventing some foreign takeovers and ramping up state support for certain technologies—are somewhat easier to justify, based on either market failures or the risk of technological dependence on foreign companies susceptible to political interference. But even in these areas, the specific policies proposed may well do more harm than good—not because Altmaier advocates state intervention but because he advocates the wrong kind of state intervention.

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Based on this analysis, the Policy Brief sketches an alternative approach to address the concerns underlying the National Industrial Strategy—namely, that Germany and the European Union are losing their technological edge and that countries that do not play by the European Union’s political and economic rulebook may soon be eating its lunch. Under the proposed alternative, Germany and the European Union would evaluate—and, if necessary, improve—the scale and targeting of existing industrial policies. They would also get serious about constraints to productivity growth that fall outside industrial policy as defined by Altmaier, including infrastructure investment gaps and barriers to the development of a genuine single EU market. Separately, the European Union would develop a comprehensive response to the challenges posed by China. Such a goal would require a well-functioning World Trade Organization (WTO) as well as EU instruments that penalize forced technology transfers and state aid by non-EU governments. It might also require state-supported research and development (R&D) targeted specifically at preventing technological dependence on authoritarian countries. These steps necessitate a strong EU-level governance structure that can identify the relevant technologies while avoiding capture by private interests and maintaining intra-EU competition.

GERMANY’S NATIONAL INDUSTRIAL STRATEGY 2030

The National Industrial Strategy’s policy proposals are premised on three assumptions:

- Notwithstanding its successes, German industry could have done better. The German consumer electronics industry succumbed to competition from Japan and Korea, Germany was unable to establish itself in the computer and smartphone industry, and neither Germany nor Europe has a significant presence in the internet economy.
- Germany’s failures in these areas are attributed to the fact that its companies lacked scale and/or enjoyed less industrial policy support than US and Japanese companies.
- Germany’s automobile industry, the core of its manufacturing sector, will be threatened unless Germany performs better in areas such as robotics, artificial intelligence, and battery cell production, where it faces massive competition from the United States, Japan, and particularly China, whose success is attributed to industrial policy.

The response to these challenges, the document argues, should not involve tariffs: “Germany is committed to the principle of free and open international markets, also in those cases in which this principle may disadvantage its own companies. We wish to reduce and abolish global customs duties and taxes, particularly for industrial products in all areas” (Altmaier 2019, 14).² Instead, the document calls for a new industrial policy based mainly on three instruments: subsidies, direct state participation in companies, and a reform of competition policy at the EU level.

The policy sets five priorities:³

1. *Industrial activity is paramount and must be defended and extended.*
 - “An increase [in the share of manufacturing in value added] to 25 percent of gross value added is viewed to be expedient and possible in Germany.”⁴ The

2. It is not immediately clear how this policy fits with the elimination of intermediate goods trade with non-EU countries, one of the aims of the National Strategy.

3. The quotations that follow are taken from pages 10 to 13 of the official English translation (Altmaier 2019).

4. Although the document refers to “industry,” it means manufacturing, whose share of German value added was 22.9 percent in 2017 (the most recent data point available).

European Union as a whole should increase the industry share from 14 to 20 percent by 2030.

- “Experience has shown that once ‘lost’ to other competitors, industrial areas are very difficult to regain. This is why we must fight for every industrial job. It is misdirected to make the wrong distinction between “old and dirty” industries and “clean new ones.”
2. *EU companies should participate only in EU value chains.*
 - “Maintaining closed value added chains is highly important: If all parts of the value chain exist in an economic area from the production of basic materials, through finishing and processing, to distribution, services, research and development, the individual links in the chain will be more resistant, and it becomes more probable that a competitive lead can be achieved or extended.”
 3. *National and European champions are essential and should be promoted.*
 - “National and European champions: Size matters! . . . If a country lacks enterprises of a requisite critical mass to realize significant projects and assert itself in international competition against large competitors, this leads de facto to being shut out of an important and growing part of the global market.”
 - “German or European mergers which are useful and necessary with a view to the global market frequently fail due to the focus on national and regional markets in prevailing law. European and German competition law must be reviewed and changed where applicable so that international competition “at eye level” remains possible for German and European companies. . . .”
 - “Existing champions such as Siemens, Thyssen-Krupp, automotive manufacturers or Deutsche Bank have existed for 100 years and longer in some cases. . . . The long-term success and the survival of such enterprises is in the national political and economic interest because they make a substantial contribution to value added and in many cases are also co-responsible for the excellent image enjoyed by the German economy and industry throughout the world.”
 4. *The state must be prepared to intervene to prevent undesirable foreign takeovers.*
 - Foreign acquisitions of domestic companies should remain legal except “to defend against risks to national security, including the area of critical infrastructures.”
- “Where takeover attempts concern technology and innovation leadership rather than primarily following the state interest in security, it is above all a matter for the private German sector and its stakeholders to prevent such takeovers by suitable bids. In these cases, the state can provide encouragement and support.”
 - “Only in very important cases should the state be able to act as buyer of shares for a restricted period of time.” Such purchases may require “the creation of a national participation facility.”
5. *The state must support “processes of great economic significance” through coordination, financial support, and direct state participation.*
 - The extent and form of state support needs to be determined based on a “new economic principle of proportionality.” “The larger the economic significance of a process, the greater the room for maneuver for the state must be for active and activating involvement. . . . This can extend to the time-limited taking over of shares and the granting of subsidies.”
 - “In terms of the question of battery cell production, of great importance to the value-added chain, state assistance [including through] support in the formation of syndicates, for example, would appear to be useful and sufficient.”
 - “By contrast, with respect to the eminently important issues of platform economy, artificial intelligence and autonomous driving, direct state involvement—as in the case of Airbus at the time—to achieve the objective would appear necessary and justified.”

ECONOMIC NATIONALISM: A PRIMER

The National Industrial Strategy 2030 marks a break with postwar German tradition, not only for its interventionism but particularly for its economic nationalism. For economic nationalists, national prosperity depends on winning—or at least catching up—in a competitive race against other countries. Policy instruments embraced by economic nationalists have historically included protectionism, restriction of inward direct investment, subsidies, directed credit, and industrial policies that foster the creation of powerful “national champions.” Common to these policies is that they seek to promote the national economic interest at the expense of foreign interests, at least in the short term.⁵

5. The term *economic nationalism* goes back to at least the beginning of the 20th century (Johnson 1917). Economists have typically defined it in policy terms (Gregory 1931, Rappard 1937, Heilperin 1960, Johnson 1968, Hieronymi 1980). An extensive body of literature in political science

Economic nationalism has distinguished intellectual roots, going back to Alexander Hamilton (1791) and Friedrich List (1841). Both argued that there could be no prosperity without industrialization and that industrial development justified—indeed, required—protection of domestic industry against foreign competition. Their ideas influenced economic policies in countries that were trying to catch up with the British Empire, including the United States, Germany, and Japan. After World War I, Italy, Germany, and Franco's Spain developed extreme forms of economic nationalism, promoting economic autarky and suspending domestic competition in favor of corporatist or syndicalist systems. Economic nationalism was also popular in emerging-market countries after World War II, in both Asia and (less successfully) Latin America. It is a hallmark of Chinese policy today.

West Germany attempted to break with both political and economic nationalism after World War II, when it embraced ordoliberalism as the economic ideology of the new Federal Republic. Unlike the laissez-faire liberals of the 19th century, ordoliberals support a strong role of the state but one that is limited to defining and strictly enforcing the rules of the market game, by maintaining price stability, fostering competition, and preventing concentrations of economic power. Economic nationalism—with its tariffs, subsidies, directed credit, and love of big, powerful firms—is anathema to ordoliberals.

The Federal Republic's actual policies never quite lived up to the ordoliberal ideal. Germany has supported national champions, from finance to the automobile industry; protected its services sector; and engaged in industrial policies, through private-public coordination, R&D grants to manufacturing firms, low-cost credit to small and medium enterprises (SMEs), and public support of start-ups. But it has generally been coy about doing so. With few exceptions, industrial policy has been either played down or motivated by non-nationalist arguments, such as innovation spillovers. Altmaier's document takes a different approach. Except for its rejection of protectionism—which, given Germany's export dependence, is not surprising—it is unabashedly nationalist, in both a German and EU sense.

Mainstream economists have often rejected—even ridiculed—economic nationalism, particularly in advanced countries, for various reasons. First, because it confuses competition between countries with competition between firms, by failing to acknowledge the benefits of international specialization—that is, the fact that countries benefit from imports as well as exports. Second, because it can conflict with two widely accepted foundations of postwar economic prosperity: international integration and competition.

Third, due to its distributional consequences and susceptibility to capture. Nationalist economic policies benefit specific producers—industrial firms, exporters, large companies—at the expense of importers, smaller competitors, and consumers. As such, the policies are susceptible to special interests (Krugman 1994, Monopolkommission 2004).

At the same time, it is hard to argue that economic nationalism is always bad. Hamilton's and List's concept of economic development, which emphasizes acquiring capabilities in a wide range of industrial activity before specializing, has largely been borne out (Imbs and Wacziarg 2003). Whether development requires protection remains controversial, but there is evidence that some forms of protection accelerated industrialization (Irwin 2000) and raised productivity growth (Nunn and Trefler 2010). Viewed in this way, some variants of economic nationalism could even *collectively* improve welfare in the long run.

That is unlikely to be the case for Altmaier's proposals. Adoption by all countries of the policies advocated in the National Industrial Strategy—raising the manufacturing share of GDP, keeping value chains inside a defined economic area, building national champions, maintaining or developing leadership in selected industries—would lead to a world with too little specialization, trade integration, and domestic competition and far too much spending on manufactured goods.

IS THE NATIONAL INDUSTRIAL STRATEGY 2030 GOOD FOR GERMANY?

Could the approach proposed in the National Industrial Strategy nonetheless be in the German (and possibly EU) interest, given the actions of countries such as China and the United States? This section attempts to answer this question by examining the potential justifications and possible unintended consequences of each of its main proposals.

1. Industrial Activity Is Paramount

Possible Justifications

From a developing-country perspective, love of industry is understandable: Except for small energy exporters, no country has ever gotten rich without broad-based industrialization. From the perspective of an advanced industrial country, the case is less obvious, but one can nonetheless think of two arguments:

- Productivity growth in manufacturing is typically higher than productivity growth in services. If this trend continues, countries with higher manufacturing shares should—all else equal—grow more rapidly.⁶

focuses on the motives behind and political functions of economic nationalism (Pryke 2012).

6. The trend may not continue. According to Baldwin (2019), the next big boost in productivity growth might be in the services sector, as “white collar robots” (sophisticated

- There may be human capital and technological links across manufacturing activities. Losing core manufacturing activities might hence result in the loss of innovative capacity that could affect productivity growth in the remaining sectors, eventually compromising the country's manufacturing base (Pisano and Shih 2009).

The first of these statements is correct but not necessarily meaningful, as “all else” is not equal. For a group of advanced economies, figure 1 shows the correlation between the share of manufacturing in 1995 and growth in per capita income over the following two decades and the change in the share of manufacturing between 1995 and 2016 and per capita income over the same period. The correlation in the first panel is virtually zero (0.08). It reflects the fact that shares of manufacturing were relatively small to begin with and differences between trend productivity growth in manufacturing and services are swamped by cross-country differences in productivity growth in both sectors. The correlation in the second panel is statistically significant and *negative*: Countries whose manufacturing share declined more tended to grow more *quickly*. This evidence is only a correlation, but it does not support the argument that resisting “de-industrialization” helps advanced countries grow more rapidly.

The second possible justification—links and complementarities within and across industrial sectors—is perhaps what the National Strategy has in mind when it argues that the loss of the consumer electronics industry “contributed to the inability of Europe to get a foothold in the new fields of telecommunications technology and computer electronics (including smartphones, tablets, etc.)” However, the counterfactual is hard to establish. Japan's much greater success in consumer electronics did not help it establish a dominant position in smartphones or tablets. Furthermore, although there are path dependencies in R&D, there is not a single example of an industrial country whose R&D capacity collapsed because its manufacturing share fell below some minimum. In 2016 the manufacturing share of the United States was about 12 percent, against 23.4 percent in Germany. Yet, ironically, the fear that Germany's innovation capacity is falling behind that of the United States is one of the main motivations of the National Industrial Strategy.

To the extent that the arguments have any validity, they seem more plausible for EU countries such as Greece or even France, whose manufacturing shares were relatively low even in 1995 and have declined significantly since then. In contrast, the notion that Germany should raise its exceptionally high manufacturing share even farther seems

impossible to justify. Germany was the only major industrial country in which manufacturing as a share of value added increased (slightly) between 1995 and 2016 (figure 1, panel b). As Südekum (2018) explains, the increase reflects two idiosyncrasies. First, the “China shock” created more jobs in Germany than it destroyed, because Germany was able to supply the types of investment goods China needed for its industrial expansion. Second, savings in Germany increased, which depressed demand for services and contributed to a sharp rise in the current account surplus during the 2000s. These factors are unlikely to continue in the future. And if they do—particularly the rise in savings—the effect could well come at the expense of other EU countries, accelerating the decline in their manufacturing shares.

A decline in the German manufacturing share is hence to be expected, for the same reasons it has declined in other advanced economies. As people become richer, their consumption of services rises faster than that of manufactured goods (Moneta and Stepanova 2018). At the same time, productivity growth in manufacturing tends to be higher than in services, thanks to robots and/or the offshoring of production (Pilat et al. 2006). Service jobs hence replace manufacturing jobs. But this change is not necessarily a bad thing: Some of it reflects the substitution of production jobs by jobs in research, consulting, and other business services. To the extent that these jobs are outsourced to independent companies, they are counted as service jobs rather than manufacturing jobs. They continue to be good jobs, however, whatever sector they belong to. German economic policy should focus on preserving and creating good jobs, whether in manufacturing or in services.

Unintended Consequences

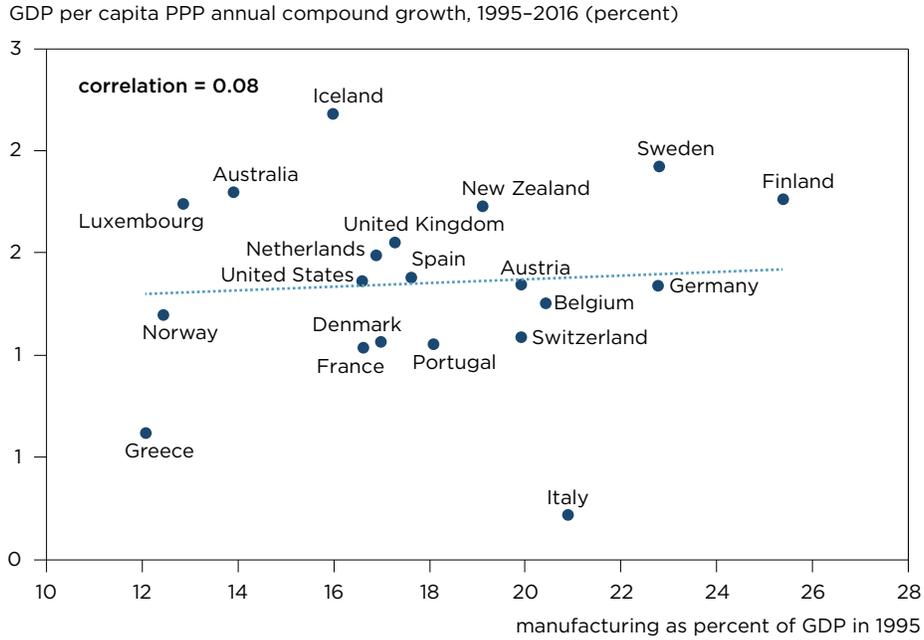
Regardless of motives, what would be the consequences of an attempt to raise the share of manufacturing in both Germany and the European Union as a whole? Does it make sense for Germany to “fight for every industrial job”?

Barring a reversal of productivity gains in manufacturing, the only way the European Union as a whole can grow its manufacturing share in value added is by increasing its share of world manufactured goods. The National Industrial Strategy calls for an increase in the EU manufacturing share from 14 percent to 20 percent by 2030. Over that period, the world—and hence the potential market for EU manufactured products—will grow. But as the world becomes richer, the share of manufacturing in world GDP should fall, from about 16 to 14 percent (see appendix A). As shown in the appendix, the implication is that the market share of EU manufactured goods would need to rise significantly, from its current level of 19 percent of world manufactured goods to about 25 percent. A rise of this magnitude would likely

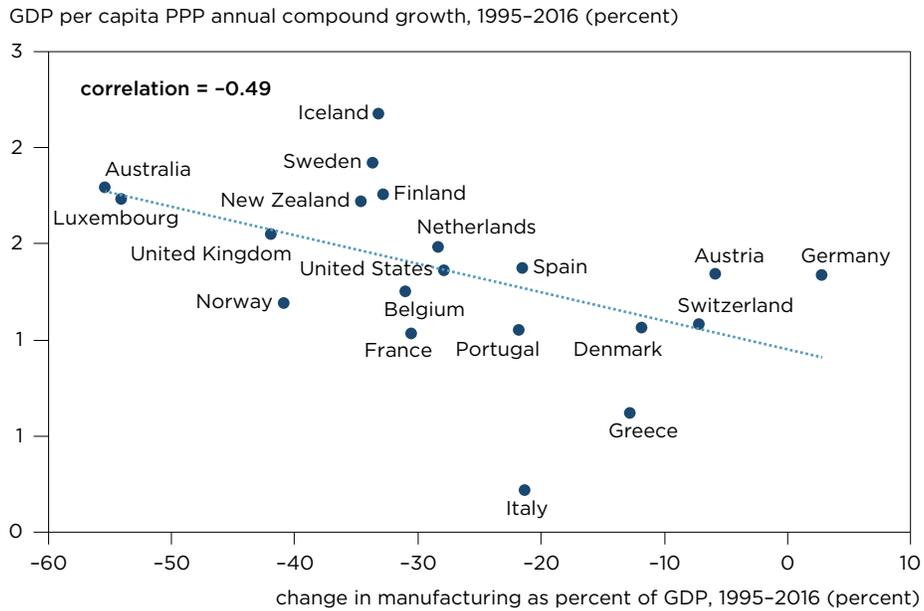
software propelled by artificial intelligence) replace jobs in administration, accounting, and legal services.

Figure 1 Correlation between per capita income growth and the share of manufacturing in selected advanced economies, 1995-2016

a. Correlation between change in annual per capita GDP, 1995-2016, and share of manufacturing in GDP in 1995



b. Correlation between change in annual per capita GDP and change in manufacturing share, 1995-2016



PPP = purchasing power parity

Note: The sample includes all countries that joined the Organization for Economic Cooperation and Development (OECD) in the 1960s and 1970s except Turkey, because of its much lower level of per capita income in 1995, and Ireland, because of problems measuring GDP at the end of the sample period.

Source: OECD.Stat dataset 6A. Value added and its components by activity, ISIC rev4.

require both import substitution by the European Union and a sharp increase in EU manufacturing exports. At a time when a large portion of the world is still industrializing and advanced countries are trying to protect their manufacturing sectors, it is hard to see how this increase could happen without triggering trade or currency wars.

Another way to look at the consequences of the proposals is to imagine what “fighting for every industrial job” might look like in practice. The National Strategy says that it is wrong to distinguish between “old and dirty” industries and “clean new ones,” implying that industrial job loss should be resisted across the board, even in “old” industries. Some job losses due to offshoring can be prevented, or even reversed, through automation of production at home.⁷ But the number of jobs that can be preserved in this way is small, because robots will mostly replace jobs that would otherwise go overseas. On balance, retaining industrial jobs will hence mean resisting productivity gains as well as the exit of industrial firms that are no longer profitable. Such policies would hurt productivity growth in the industrial sector and hence undermine its competitiveness (Bravo-Biosca, Criscuolo, and Menon 2016; Decker et al. 2017). After some delay, they would accelerate rather than prevent industrial decline.

2. EU Companies Should Participate Only in EU Value Chains

Possible Justifications

International value chains—the cross-border trade in intermediate goods used in the production of a final good— increase productivity by assigning various stages of the production process to the most efficient units (Baldwin 2016). The more restricted the economic area over which this “unbundling” can happen, the smaller the potential efficiency gain. Prima facie, it is hard to see how limiting participation in value chains to the European Union could be good for German or EU competitiveness.

The argument hinted at in the National Strategy is that value chains inside one economic area would be “more resistant,” presumably because they are immune to trade wars and other geopolitical disruptions. However, this claim in itself is not an argument for restricting extra-EU trade in intermediate goods: An EU firm ordering an intermediate input from, say, a firm in China presumably understands that doing so involves a bigger risk of disruption than ordering the same input from Slovakia and weighs this risk against the cost advantages of importing from China.

Justifying policies to discourage imports of intermediate goods from outside the European Union hence requires an additional argument—that sourcing critical inputs from a potentially hostile country creates a security risk, for example, or that the disruption risk taken by upstream firms creates a negative externality for the remaining value chain. Both arguments are unconvincing: Security risks can be handled by restricting the source countries of specific inputs rather than keeping all value chains in the European Union, and externalities arise only if the potential costs of disruption are not offset by lower prices charged to downstream firms. Furthermore, if any such externality were to arise, it could be removed by imposing a tariff on imports of intermediate goods from outside the European Union rather than by discontinuing such imports altogether.

Unintended Consequences

An obvious problem of policies to force value chains to stay inside the European Union is that such policies may be illegal under WTO rules. They would amount to precisely the kind of protectionism the National Strategy wants to avoid. Indeed, the National Strategy’s call for “reshoring” value chains is the most Trumpian feature of the document.

Beyond this problem, the cost of discouraging imports of intermediate goods from outside the European Union is the associated loss in efficiency. How much such losses matter depends on the importance of intermediate goods imports from outside the European Union in EU value chains. Figure 2 plots the value-added share of non-EU imports in the value added of exports from Germany, the EU-13 (members who joined since 2004), and the EU-15 (members who joined before 2004). The European Union includes the United Kingdom: Excluding the United Kingdom raises non-EU value added content by about 1.5 percentage points.

Although the value-added share of non-EU imports in EU exports has been declining since 2012, it remained substantial in 2015: 10.5 percent for German exports, 12.0 percent for EU-15 exports, and 14.0 percent for EU-13 exports. Although some of this value added comes from imports of raw material, most of it is intermediate inputs (excluding mining and quarrying as an import category would reduce the share of EU-15 export value added attributable to non-EU imports from 12 percent to about 10 percent). Requiring EU firms to substitute away from non-EU intermediate inputs could thus have a significant adverse impact.

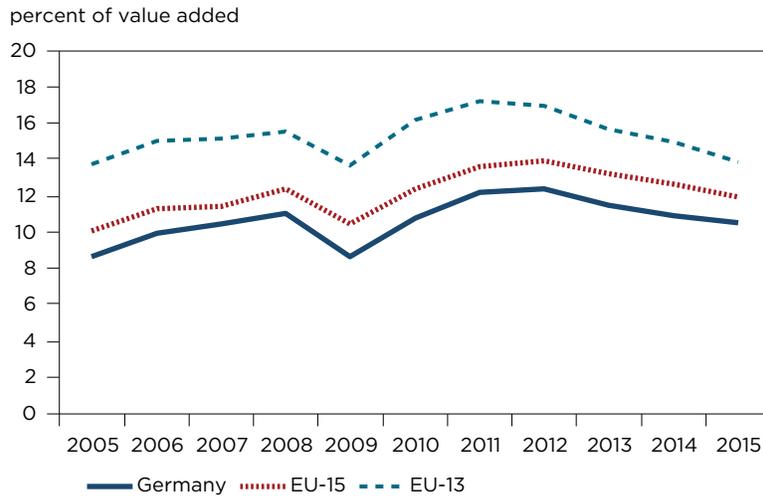
3. National and European Champions Are Essential and Should Be Promoted

Possible Justifications

The National Industrial Strategy’s views on national and European champions encompass two claims. The first is that

7. See “Your Clothes Could be Made in the USA Again,” Bloomberg, October 19, 2018, www.bloomberg.com/opinion/articles/2018-10-19/clothing-manufacturing-may-be-moving-back-to-west-from-asia.

Figure 2 Value added from outside the European Union as a share of total value added of exports from EU countries, 2005-15



Note: EU-13 includes Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, and Slovenia; EU-15 includes the remaining EU countries.

Source: OECD.Stat Trade in Value Added (TiVA) database.

size matters, that EU and German competitiveness depend on the ability to create very large companies. The second is that current EU competition law prevents the creation of such companies and hence needs to be reviewed.

With respect to the first claim, the National Strategy argues that some markets—such as railway systems and plant construction—involve competition for enormous projects and that only extremely large companies can access financing for such projects. This argument is unconvincing: Very large projects could (and often do) involve bidding by consortia of companies; if necessary, they can be financed through multiple sources, including bank syndicates. As the European Commission (2019a, 16) puts it, “there is nothing that requires a European ‘champion’ to be a single company.” As long as it does not reduce competition within the European Union, cooperation of this type is admissible under EU law (Motta and Peitz 2019).

A more convincing argument for single-company European champions might be economies of scale. The marginal costs of production may decline with the number of units produced. Building an efficient production facility makes sense only if the company expects to produce many units. If each unit is very expensive to produce, one could argue that efficient production requires extremely large companies, because the range of production within which variable costs keep falling implies enormous revenues.

The large commercial jet industry is often cited as one

in which this argument applies. Could it also apply to other manufacturing sectors? Seabright (2005, 53) argues that this is unlikely:

The aerospace sector has some particular characteristics that make it a suitable setting for publicly sponsored innovative projects, and which by the same token suggest caution before launching such projects in other sectors. . . . The three crucial technological characteristics are: high fixed costs of production, variable costs of production that fall significantly with scale, and products that are somewhat less differentiated than in other comparably high-technology sectors such as motor vehicles and precision instruments.

The argument that EU competition law is too strict to allow mergers that might increase efficiency requires separate justification. EU competition law explicitly requires the European Commission to consider efficiency gains. According to the Commission’s *Guidelines on the Assessment of Horizontal Mergers*, “it is possible that efficiencies brought about by a merger counteract the effects on competition and in particular the potential harm to consumers that it might otherwise have” (European Commission 2004, C 31/13). The 2018 request by Siemens and Alstom to merge their rail businesses was not denied because the European Commission ignored possible efficiency gains but because it could not find evidence for such efficiencies: “The parties did not bring

forward any substantiated arguments to explain why the transaction would create merger specific efficiencies.”⁸

That said, “the relevant benchmark in assessing efficiency claims is that consumers will not be worse off as a result of the merger” (where *consumers* include any customers of the parties to the merger, whether firms or households). There is thus a possibility that a merger could be denied even though allowing it would create a more efficient global company—either because the efficiencies arise only in mega-projects for the world market, rather than the EU market, or because efficiencies at the EU level are insufficient to offset the harmful effect of increased market power in the eyes of the European Commission’s Directorate General for Competition (DG Comp). Whether this situation is likely to arise in practice is unclear.

Unintended Consequences

As proposed in the National Industrial Strategy, national champions could have undesirable consequences through two channels: national champion status per se and the effect of changes in competition law that would make it easier to create national champions.

The “national champion” label implies an implicit or explicit state guarantee. The National Industrial Strategy makes this guarantee very clear, stating that “the long-term success and the survival of such enterprises is in the national political and economic interest” (Altmaier 2019, 12). A guarantee of this type is harmful for three reasons: It creates a sense of impunity that can induce reckless behavior, it creates fiscal risks, and it creates economic power that hurts competitors and potentially customers of these companies (including competitors in the European Union).

These effects were extensively discussed by the German Monopolies Commission, an independent expert panel, in reaction to Chancellor Gerhard Schröder’s enthusiasm for national champions (Monopolkommission 2004). The commission’s warnings were subsequently borne out by the disaster suffered by state-owned German banks during the global financial crisis, at huge cost to the taxpayer. Precrisis risk-taking by these banks—including massive investments in US mortgage-backed securities and collateralized debt obligations (CDOs)—can be linked to the presence of state guarantees (Hellwig 2018; see also Körner and Schnabel 2013 and Fischer et al. 2014).

The second channel through which the National Industrial Strategy’s embrace of national and EU champions could hurt the EU economy is through the proposed change

in EU competition law. As Monopolkommission (2004) points out, the purpose of current EU law is to ensure that competition is not sacrificed to special interests and political expediency. Allowing a political override of the commission’s decisions—or asking it to make tradeoffs between competition and extraneous objectives, such as the creation of European champions or geopolitical objectives—could defeat that purpose. Even if there are cases in which competition considerations deserve to be overruled in the interests of broader considerations, such as “international competition ‘at eye level’” with Chinese companies (Altmaier 2019, 11), allowing such tradeoffs could lead to welfare-reducing decisions in many more cases. Furthermore, with respect to the objective of fostering innovation, it is not clear that there even is a tradeoff. Haucap, Rasch, and Stiebale (2019) find that mergers in the pharmaceutical industry reduced patenting and R&D in both the merged entity and rival firms.

The United States offers a cautionary tale. Concentration and corporate profits have been rising in the United States since the late 1990s. Gutierrez and Philippon (2017) show that industries that became more concentrated experienced lower investment and that the correlation between concentration and total factor productivity growth turned negative in the 2000s. In contrast, in the European Union, concentration decreased and investment held up better than in the United States. Gutierrez and Philippon (2018, 25) attribute this to the fact that “DG Comp is more independent and more pro-competition than any of the national regulators, and also the US regulators.” This claim is supported by policy indicators and data on antitrust enforcement—consistent with the intellectual history of US competition policy (see Wu 2018)—as well as by the fact that US firms spend substantially more on lobbying than EU firms and are far more likely to do so successfully than European firms or lobbyists. If the US experience is any guide, less stringent application of competition policy is more likely to hurt EU competitiveness than to strengthen it.

4. The State Must Intervene to Prevent Undesirable Foreign Takeovers

Possible Justifications

The National Industrial Strategy 2030 is motivated partly by fears of technological dominance by China. Other Western governments and the private sector share these fears, particularly since the publication of *Made in China 2025*, an industrial policy plan that seeks to gradually replace foreign with Chinese technology in all high-tech industries (Wübbecke et al. 2016, European Chamber of Commerce in China 2017, McBride and Chatzky 2018, BDI 2019). In part, the concern is loss of market share to Chinese competitors that are directly or indirectly subsidized by the state. A related

8. European Commission, *Mergers: Commission Prohibits Siemens’ Proposed Acquisition of Alstom*, February 6, 2019, http://europa.eu/rapid/press-release_IP-19-881_en.htm.

concern is that Chinese companies that are “to an unknown extent controlled by an undemocratic authoritarian regime” will acquire a monopoly in key technologies.⁹ To the extent that Chinese companies acquire state-of-the-art technology by purchasing foreign companies, creating an instrument that allows the German government to prevent such purchases could slow China’s technological domination.

A possible objection is that acquisition of foreign companies is a minor factor propelling China’s technological advance. More important factors include technology theft; forced technology transfers (the requirement that Western companies seeking access to the Chinese market transfer technology to Chinese firms; see Branstetter 2018); and successful R&D, fueled by the incentives created by a vast domestic market, government support, and large numbers of recent graduates in science and technology. The proposed policy instrument would do nothing to slow China’s catch-up through any of these channels. That said, China might use takeovers to acquire technology when alternative channels fail, justifying the proposal.

Unintended Consequences

The most obvious negative consequence of this proposal is that it could stifle desirable Chinese foreign direct investment (FDI), which can provide welcome risk capital for German and EU firms and contribute to the success of start-ups. This fear is analogous to the worry that “America’s reactions [to Chinese FDI] will do the country’s tech scene more harm than Chinese attention. . . . start-ups that had been banking on an ability to raise Chinese funds or sell to the Chinese might see their plans squashed.”¹⁰

A second worry is that financially backed “encouragement and support” to persuade German companies to refuse foreign takeover bids might be used to limit foreign ownership for generic nationalist reasons, even when bids come from companies based in friendly countries. There are precedents for such actions, including moves by successive French governments to block the acquisition of Danone by US or Japanese companies in the 2000s.

Finally, the context of the proposed participation facility is not only fear of Chinese takeovers but also the National Industrial Strategy’s intention to “fight for every industrial job.” Takeover targets are often weaker companies that are attractive to investors intending to restructure them. When these investors are foreign, the proposed participation facility might give the government an instrument for acquiring such

weak but politically well-connected companies, particularly when job losses are feared, with harmful consequences for structural change.¹¹

5. The State Must Intervene to Support “Processes of Great Economic Significance”

Possible Justifications

Although framed more generally, Altmaier’s appeal for more state intervention seems to refer mostly to state support for “ground-breaking innovation.” There are at least two ways of justifying such support.

The standard argument for public or publicly subsidized R&D is that the social benefits of innovation are higher than its private returns. This argument might apply not only to upstream (basic) research but also to downstream research, including product development, which may have a demonstration effect on other firms. It could justify state support even in instances when a technology already exists worldwide but has not been implemented or adapted nationally (Rodrik 2004).

Public R&D support might also be justified as a reaction to strategic behavior of a government-backed foreign firm that seeks a monopoly in a technological frontier area. For this argument to work, one needs to assume that it is very difficult for competitors to catch up once they have fallen behind. The National Industrial Strategy makes this assumption (“once ‘lost’ to other competitors, industrial areas are very difficult to regain”). But although the presence of technological path dependence is widely accepted (see, for example, Aghion, Boulanger, and Cohen 2011), the argument that it could lead the victorious firm to establish a permanent monopoly is hard to make, except in areas in which there are network externalities, such as internet platforms.¹² That said, even a temporary monopoly could create significant damage if it is in the hands of a company that can be controlled by a potentially hostile state.

The two arguments have different implications. According to the first, only new (if any) activities merit government support. According to the second, the government

9. *The Economist*, March 15, 2018, “The Challenger,” www.economist.com/briefing/2018/03/15/the-challenger.

10. *Ibid.*

11. On this point and additional harmful consequences of restricting inward FDI, see German Council of Economic Experts (2007).

12. A large body of literature on the strategic use of subsidies to allow domestic firms to capture rents in international trade dates back to the 1980s (see Brander and Spencer 1983, 1985; Krugman 1987, 1989; and Brander 1995). It shows that there is a potential economic case for subsidies as a strategic trade policy but that the case is not robust: It is sensitive to assumptions about the nature of competition, domestic costs of subsidies, market entry, and the possibility of capture by special interests.

may have cause to support both new and existing firms and activities.

Unintended Consequences

The most common argument against state support for industrial ventures is that the state is bad at picking winners, in part because of its susceptibility to capture by private interests. Examples of failed sector- and firm-specific industrial policies abound, particularly in Africa and parts of Latin America (see Naudé 2010 for an overview and references). At the same time, Rodrik (2008) and Naudé (2010) argue that industrial policies helped newcomers industrialize in East Asia and Europe, and Mazzucato (2015) describes examples of successful state technology investments in the United States.

Government failures must of course be compared with market failures, both in picking winners and in withdrawing support from losers. Seabright (2005) and Rodrik (2004, 2010) both argue that “There is no evidence that politicians are any less good than private markets at picking winners. But markets appear to be much better than politicians at terminating projects that turn out to be unsuccessful” (Seabright 2005, 52). As Monopolkommission (2004, 8) observes, the difficulty of terminating state support for unsuccessful projects or firms is not surprising: “Various interests articulate themselves in the political process to varying degrees. Existing industries that benefit from state protection have a much stronger lobby than firms that hardly yet exist, which can only promise to contribute to growth based on innovation.” Lobbying biases industrial policy against new activities that may merit support and in favor of old activities that do not. The end result may be that the state supports activities with negative social value. This both wastes public money and ties up economic resources in activities that should be closing down, making life harder for new activities that need these resources.

A third potential problem—aside from picking the wrong activity and continuing to support it after it turns out to be unsuccessful—is lack of additionality. Some welfare-improving activities might have come to fruition without help from the state. To the extent that the state supports such activities, it is wasting money.

Summary of the Discussion of National Industrial Strategy Proposals

Of the five proposals pushed by the National Industrial Strategy, the first three—raising the share of manufacturing in value added in Germany and the European Union as a whole, restricting value chains to the European Union, and promoting national and European champions by revising EU competition law—cannot be justified except under very

narrow assumptions. As they are also likely to have significant negative unintended consequences, there is no tradeoff to speak of. These ideas should not be pursued.

It is somewhat easier to justify the remaining two ideas—preventing certain foreign takeovers and providing state support to “processes of great economic significance.” Market failures and system failures could justify additional government support of downstream industrial R&D. There are also reasons to be concerned about technological dependence on foreign companies susceptible to political interference. The policies the National Industrial Strategy proposes to address these problems may well do more harm than good, however.

WHAT IS THE ALTERNATIVE?

The proposals of the National Industrial Strategy are problematic but raise valid questions. How should Germany conduct its industrial policy? Does it need to change its approach in order to stay at the technology frontier? How should Germany—and the European Union—respond to the challenges created by China?

Rethinking German industrial policy primarily from an economic nationalist perspective—particularly as a response to the challenge posed by China—is not helpful. It leads to policy prescriptions that could have massive harmful consequences. Moreover, responding to China may require instruments that go beyond industrial policy. Ignoring them overburdens industrial policy.

It would hence be better to follow a different, two-step approach. First, policymakers should create the best conditions for productivity growth and innovation in Germany and the European Union—including, but not limited to, industrial policy instruments. Second, they should consider additional steps to deal with the challenges posed by China.

Improving German and EU Industrial Policy

Contrary to the impression created by the National Industrial Strategy, Germany has a dense web of industrial policies. It engages in extensive public-private coordination and cooperation, in research, in vocational training and education, and through initiatives such as Industrie 4.0.¹³ Its Fraunhofer Institutes, “Europe’s largest application-oriented research organization,”¹⁴ are widely admired as a model for public and private collaboration in funding, generating and disseminating

13. Germany’s Industrie 4.0 is a plan to promote networked factories and the “internet of things,” through standard-setting, private-public coordination, digital infrastructure, and R&D grants.

14. See www.fraunhofer.de/en/about-fraunhofer/profile-structure.html.

nating applied research. German companies receive public financial support from multiple sources, including R&D grants awarded by federal and state governments and low-cost SME credit and equity supplied by the Kreditanstalt für Wiederaufbau (KfW), the second-largest national promotional bank in the world (after the Chinese Development Bank). Germany's publicly supported seed capital fund, the High-Tech Gründerfonds, claims to have successfully launched more than 500 high-tech companies since 2005. According to OECD data, Germany's R&D spending as a share of GDP has been steadily rising since the mid-1990s. It now exceeds 3 percent—about in line with Japan (3.2 percent) and the United States (2.8 percent) and ahead of China (2.2 percent), albeit behind Korea (4.5 percent).

Policymakers should create the best conditions for productivity growth and innovation in Germany and the European Union...[and] should consider additional steps to deal with the challenges posed by China.

This system looks impressive, but it could have weaknesses or gaps. Identifying them requires defining the relevant objective. In principle, industrial policy can be justified as a response to (broadly defined) market and system failures and as strategic support of domestic companies against foreign companies.¹⁵ It is easy to rationalize existing policies as responses to innovation spillovers and coordination failures within the private sector and between the private and public sectors. It is less clear that they can be rationalized as strategic support for domestic against foreign companies (especially as most German exports take place in competitive international markets). The National Industrial Strategy wants to see more strategic support. But, as argued in the previous section, the economic case for such support is weak, except possibly in a defensive sense, as discussed in the next section.

Even if the orientation of Germany's industrial policy is broadly right, it could fall short in many ways. The government should be asking the following questions:

1. Is the scale of public support for R&D adequate? How does it compare with that of other industrial countries, taking account implicit channels of industrial policy, such as technology contracts awarded by the US military?
2. Is public support well targeted? Is it additional, or would some activities that are currently being subsidized have happened anyway? If it is additional, is it supporting promising new activities, or does it subsidize old activities, including industries that should be exiting? (Answering this question requires an evaluation of the governance structures through which support is administered.)
3. Should more emphasis be placed on equity than on grants or loans, to allow the state to capture some upside risk, as suggested by Mazzucato (2015)?
4. Should support activities be transferred from the national to the European level? A centralized approach would make sense if the purpose is the industrial development of the European Union as a whole and because an EU-level governance structure might be less susceptible to capture. But Aghion, Boulanger, and Cohen (2011) argue that in the presence of capture, it is better to decentralize support, so that beneficiaries compete.
5. Is the industrial policy ecosystem really the binding constraint for technology development and productivity growth in Germany? It is easy to think of other obstacles, perhaps of a more fundamental nature, including (a) the continuing poor state of German transport and digital infrastructure; (b) shortages of skilled labor; (c) a university system that leaves scope for improvement in both teaching and research; (d) the inefficient allocation of scarce labor and talent, in part because of a system that discourages exit of unproductive firms and continues to protect certain sectors, such as professional services; and (e) the lack of a genuine EU single market, which prevents the scaling of activities and hence reduces the returns to innovation.

Similar questions should be asked of other EU countries, and the European Union as a whole, building on an extensive body of work (Aiginger 2007; European Commission 2017, 2019a).

Responding to China: A Role for Industrial Policy?

Worries about Chinese technological catch-up reflect three concerns:

- loss of market share to Chinese companies, including state-backed companies that may not be competing on fair terms,

15. See Rodrik (2004, 2008, 2010); Aghion, Boulanger, and Cohen (2011); Warwick (2013); and Mazzucato (2015). The mainstream view is that, absent additional externalities (related to the environment, for example), the state should support new activities with "the clear potential of providing spillovers and demonstration effects" (Rodrik 2004, 23), without any sectoral bias. Mazzucato (2015) goes farther, arguing that the state should identify technological "priority areas" (47) and "envision a direction for technological change and invest in that direction" (5).

- a sense that Western technology is being appropriated without adequately compensating its owners, for reasons ranging from lax enforcement of intellectual property rights to forced technology transfer, and
- fears that Western companies and consumers may become dependent on technologies controlled by companies that can be influenced by an authoritarian government.

Part of the response to these challenges is to create the best possible conditions for the success of European firms, including through the industrial policies just described, without adopting Chinese policies such as mega-mergers and vast subsidies to preferred sectors whose success is questionable even in China.¹⁶ In addition, it requires a functioning WTO that is in a position to enforce its rules (Payosova, Hufbauer, and Schott 2018). As the WTO does not offer effective mechanisms against either domestic subsidies (Wu 2016) or technology transfers on unfair terms (Branstetter 2018), it will also require EU-level instruments, possibly including the following:¹⁷

- Penalizing state aid by non-EU governments (by applying price adjustments to subsidized foreign companies participating in EU procurement or excluding them altogether, for example).¹⁸
- Requiring EU firms to disclose when they are subject to forced technology transfers or intellectual property theft. Investment and technology transactions by companies and/or countries that are found to engage in such behavior would be subject to stricter approval standards (Branstetter 2018). Unlike the “participation fund” proposed by the National Industrial Strategy or the general investment screening adopted by the European Union in early 2019,¹⁹ this measure not just

would prevent technology transfers in the context of company acquisitions but also might deter forced technology transfer more broadly.

Together these measures would go some way toward helping EU companies, leveling the playing field, and reducing the chances that the European Union will become technologically dependent on China. However, they will not go all the way. The screening framework the European Union just adopted is weak, reflecting resistance by EU members that want to attract Chinese investment.²⁰ And even if tougher or better rules were to stop forced or unwanted technology transfer, these would at best slow China’s technological advances, since the latter are increasingly home-grown. The European Union’s only long-term instrument to prevent technological dependence on China is to ensure, through state-funded R&D if necessary, that it does not fall behind in technologies that both are critical for EU value chains and may not be available for purchase in the European Union or friendly democracies (including the United States).²¹

Unlike the industrial policies proposed by economists such as Rodrik (2004), this type of “defensive” industrial policy would require identifying and funding specific technologies. As it concerns the entire European Union, it should take place at the EU level, possibly through a new agency or program. Apart from adequate funding, the governance structure of such a program is critical. Effective monitoring requires proximity to the private sector but avoidance of capture by large companies or sectors. Maintaining or increasing competition within the European Union is also critical: Even the best capability in a sensitive technology is not helpful if the technology is so expensive that EU firms and governments end up purchasing the Chinese alternative anyway. In navigating these difficulties, the European Union should try to evaluate the experiences of other countries, such as the United States and France, which have attempted

16. Lardy (2019) attributes the decline in Chinese productivity growth to declining competition and the growing share of resources channeled to unproductive state firms. China’s former finance minister Lou Jiwei was recently quoted as saying that Made in China 2025 has been “a waste of taxpayers’ money” (*South China Morning Post*, March 7, 2019, www.scmp.com/news/china/diplomacy/article/2189046/chinas-tech-strategy-all-talk-no-action-and-waste-taxpayers).

17. For a more detailed analysis along similar lines, see European Commission (2019a).

18. The European Commission (2019b) has promised a proposal in this area by the end of 2019. An “international procurement instrument” that would allow the European Union to retaliate against countries that close their procurement markets to EU firms was proposed in 2016 but never adopted. See Petropoulos and Wolff (2019) and BDI (2019).

19. See Reuters, “With Eyes on China, EU Lawmakers Back Investment Screening,” February 14, 2019, www.reuters.com/article/us-eu-china-investment-idUSKCN1Q31JU.

20. The framework does not require member states to screen, and the decision on whether to allow an investment lies with the member state. As of March 2019, only half of EU members had screening procedures. See “Screening of Foreign Direct Investment—an EU Framework,” http://trade.ec.europa.eu/doclib/docs/2019/february/tradoc_157683.pdf.

21. Although recent statements by EU politicians—Altmaier (2019), Altmaier and Le Maire (2019), and President Macron in his March 2019 “Letter to Europe” (see www.theguardian.com/commentisfree/2019/mar/04/europe-brexit-uk)—seem to suggest that the United States should be regarded as great a rival to the European Union as China, the United States remains a military ally and has independent courts and a Congress with significant oversight powers. Depending on US companies for a critical technology is not the same as depending on Chinese companies.

to mobilize state support for large, ambitious R&D projects in specific sectors.²²

The aim and scope of this type of publicly funded technology support is very different from what is proposed in the National Industrial Strategy. Altmaier wants the state to support innovative projects based on the principle that anything of “great economic significance” deserves state intervention. Specific areas worthy of state support are preidentified in the Strategy. In contrast, in the program proposed here, experts, not politicians, would identify projects that warrant government support, based on a much narrower objective and a competitive process. The best analogy is to competitive defense contracts that fund specific technologies for national security purposes. As in the defense example, identifying such technologies can involve inefficiencies and (if competition breaks down) rents. But to the extent that the program would allow the European Union to retain a capability in critical technologies that cannot be procured from friendly countries, it may be worth it.

CONCLUSION

Germany’s new National Industrial Strategy contains some bad ideas: raising Germany’s already high manufacturing share rather than focusing on good jobs and productivity growth; discouraging EU firms from participating in value chains that extend outside the European Union; supporting or creating national champions even when doing so hurts competition; fending off unwanted foreign investment through government stakes; and allocating government funding based on a fuzzy “new economic principle of proportionality” that states that anything of “great economic significance” is worthy of support, leaving it to politicians to decide what that means.

Although the proposed solutions are mostly misguided, the questions and concerns motivating the National Industrial Strategy are largely valid. What should Germany and the European Union do to invigorate productivity growth and remain at the technological frontier? How should the European Union respond to the challenge of China, a country that is rapidly becoming a world-class

industrial competitor but does not play by Western political or economic rules?

Germany and the European Union should evaluate both the scale and the targeting of existing—and in the case of Germany, already quite extensive—industrial policies. But they should also do something about constraints to productivity growth that fall outside industrial policy as defined by Altmaier. These constraints include infrastructure investment gaps, bottlenecks, misallocation of skilled labor and scientific talent, and the lack of a genuine EU single market. Addressing these problems is financially and politically costly, which is why little is being done about them. The new debate about industrial policy should not be used to distract from these problems.

The rise of China requires a comprehensive response—not because the West should seek to suppress an increasingly capable competitor but because it needs to protect its firms from unfair practices and its citizens from the possibility that an authoritarian system may abuse its economic power. Apart from a functioning WTO, the response requires EU instruments that penalize forced technology transfers and state aid by non-EU governments. It may also justify an EU-level instrument for state-supported R&D targeted at preventing technological dependence on China or other authoritarian countries. A governance structure is needed that can identify and fund the relevant technologies while avoiding capture by private interests and maintaining competition within the European Union.

Altmaier deserves credit for invigorating the debate about economic policy in Germany and the European Union. He is right to challenge orthodoxy. He is also right that Germany needs to use public spending more aggressively to spur innovation and growth. But most of his proposals are wrong. The next phase of the debate must involve a more careful diagnosis of where existing industrial policies fall short, take a broader approach in responding to China, and extend beyond industrial policy.

22. The US experience includes the Defense Advanced Research Projects Agency (DARPA) (Mazzucato 2015). The French experience includes the Agence de l’innovation industrielle (All), created in 2005, in response to a commission report led by Jean-Louis Beffa (see Beffa 2005, Véron 2005, and Cohen 2007). All was eventually folded into BPI France, a public investment bank that focuses on SME finance but also undertakes “one-off capital investments in larger firms that are considered strategic in terms of the national economy” (see BPI France, “The Doctrine,” May 2013, www.bpifrance.com/content/download/3500/46663/version/2/file/Bpifrance_LA%20DOCTRINE%20042014_GB_WEB.pdf).

APPENDIX A

Let M_{EU} and M_w denote EU and world manufacturing value added, respectively, and Y_{EU} and Y_w EU and world GDP, respectively. $\frac{M_{EU}}{Y_{EU}}$ is the EU manufacturing share (currently 14 percent), $\frac{M_w}{Y_w}$ the world manufacturing share (about 16 percent), $\frac{M_{EU}}{M_w}$ the EU share in world manufacturing value added (19 percent), and $\frac{Y_{EU}}{Y_w}$ the EU share in world GDP (16 percent). The following identity holds:

$$\frac{M_{EU}}{Y_{EU}} \equiv \frac{M_{EU}}{M_w} * \frac{M_w}{Y_w} * \frac{Y_w}{Y_{EU}}$$

Using “hats” to denote growth rates and rearranging yields

$$\frac{\widehat{M_{EU}}}{\widehat{M_w}} \equiv \widehat{M_{EU}} - \widehat{M_w} - \widehat{Y_{EU}}$$

The National Industrial Strategy calls for an increase in the EU manufacturing share from 14 to 20 percent of value added by 2030, a rise of 43 percent. The OECD’s long-term projections imply that the world economy will grow

by about 38 percent by 2030 while the EU economy will grow by about 16 percent. Hence $\frac{Y_w}{Y_{EU}}$ should grow by about $38 - 16 = 22$ percent. Given the projected increase in Y_w , $\frac{M_w}{Y_w}$ should fall from its current level of about 16 percent to about 14 percent,²³ a decline of 13 percent. Hence an increase of $\frac{M_{EU}}{Y_{EU}}$ from 14 to 20 percent by 2030 requires a rise of $\frac{M_{EU}}{M_w}$ by $43 - 22 + 13 = 34$ percent—that is, an increase in the share of EU manufacturing from its current level of 19 percent in world manufacturing to about 25 percent.

23. This calculation was estimated in two ways, using 1990–2016 data from the World Bank’s *World Development Indicators* (WDI), with consistent results. The first approach involved running a simple linear regression of the world manufacturing share on world purchasing power parity (PPP)-adjusted income per capita. The second involved fitting a quadratic function to the correlation between manufacturing shares and PPP-adjusted income per capita for all countries in the WDI. The fitted relationships were then used to estimate the world manufacturing share associated with world GDP per capita in 2030, using OECD long-term growth projections.

REFERENCES

- Aghion, Philippe, Julian Boulanger, and Elie Cohen. 2011. *Rethinking Industrial Policy*. Bruegel Policy Brief 2011/04. Brussels: Bruegel.
- Aiginger, Karl. 2007. Industrial Policy: A Dying Breed or a Re-emerging Phoenix. *Journal of Industry, Competition and Trade* 7: 297–323.
- Altmaier, Peter. 2019. *National Industrial Strategy 2030: Strategic Guidelines for a German and European Industrial Policy*. Berlin: Federal Ministry for Economic Affairs and Energy. Available at www.bmwi.de/Redaktion/EN/Publikationen/Industry/national-industry-strategy-2030.html.
- Altmaier, Peter, and Bruno Le Maire. 2019. *A Franco-German Manifesto for a European Industrial Policy Fit for the 21st Century*. Berlin: Federal Ministry for Economic Affairs and Energy.
- Baldwin, Richard. 2016. *The Great Convergence: Information Technology and the New Globalization*. Cambridge, MA: Belknap Press of Harvard University Press.
- Baldwin, Richard. 2019. *The Globotics Upheaval: Globalization, Robotics, and the Future of Work*. New York: Oxford University Press.
- BDI (Bund der deutschen Industrie). 2019. *Partner and Systemic Competitor: How Do We Deal with China’s State-Controlled Economy?* Policy Paper/China, January. Available at <https://english.bdi.eu/publication/news/china-partner-and-systemic-competitor/>.
- Beffa, Jean-Louis. 2005. *Pour une nouvelle politique industrielle*. La Documentation Française. Available at www.ladocumentationfrancaise.fr/rapports-publics/054000044/index.shtml#book_presentation.
- Brander, James A. 1995. Strategic Trade Policy. In *Handbook of International Economics*, vol. 3, ed. Gene Grossman and Kenneth Rogoff. Amsterdam: Elsevier.
- Brander, James A., and Barbara J. Spencer. 1983. International R&D Rivalry and Industrial Strategy. *Review of Economic Studies* 50, no. 4: 707–22.
- Brander, James A., and Barbara J. Spencer. 1985. Export Subsidies and International Market Share Rivalry. *Journal of International Economics* 18, no. 1–2 (February): 83–100.
- Branstetter, Lee G. 2018. *China’s Forced Technology Transfer Problem—and What to Do About It*. PIIE Working Paper 18-13. Washington: Peterson Institute for International Economics.
- Bravo-Biosca, Albert, Chiara Criscuolo, and Carlo Menon. 2016. What Drives the Dynamics of Business Growth? *Economic Policy* 31, no. 88: 703–42.
- Cohen, Elie. 2007. Industrial Policies in France: The Old and the New. *Journal of Industry, Competition and Trade* 7: 213–27.
- Decker, Ryan A., John Haltiwanger, Ron S. Jarmin, and Javier Miranda. 2017. Declining Dynamism, Allocative Efficiency, and the Productivity Slowdown. *American Economic Review* 107, no. 5: 322–26.
- European Commission. 2004. Guidelines on the Assessment of Horizontal Mergers under the Council Regulation on the Control of Concentrations between Undertakings. *Official Journal of the European Union* C 031 (February): C31/5–C31/18. Brussels.
- European Commission. 2017. *Investing in a Smart, Innovative and Sustainable Industry. A Renewed EU Industrial Policy Strategy* (September 13). Brussels.
- European Commission. 2019a. *EU Industrial Policy After Siemens-Alstom: Finding a new balance between openness and protection* (March 18). Brussels.
- European Commission. 2019b. *EU China: A Strategic Outlook* (March 12). Brussels.

- European Union Chamber of Commerce in China. 2017. *China Manufacturing 2025: Putting Industrial Policy Ahead of Market Forces*. Beijing.
- Fischer, Markus, Christa Hainz, Jörg Rocholl, and Sascha Steffen. 2014. *Government Guarantees and Bank Risk Taking Incentives*. Research Working Paper ESMT-14-02. Berlin: European School of Management and Technology.
- Furman, Jason, and Peter Orszag. 2018. *Slower Productivity and Higher Inequality: Are They Related?* PIIE Working Paper 18-4. Washington: Peterson Institute for International Economics.
- German Council of Economic Experts. 2007. Beschränkung des Beteiligungserwerbs durch ausländische Investoren? In *Annual Report*: 384–437. Wiesbaden.
- Gregory, Theodore E. 1931. Economic Nationalism. Address given at Chatham House, March 12. *International Affairs (Royal Institute for International Affairs 1931–39)* 10, no. 3: 289–306.
- Grullon, Gustavo, Yelena Larkin, and Roni Michaely. 2017. *Are US Industries Becoming More Concentrated?* (April). Available at <https://pdfs.semanticscholar.org/138f/249c43bfec315227a242b305b9764d57a0af.pdf>.
- Gutiérrez, Germán, and Thomas Philippon. 2017. *Declining Competition and Investment in the US*. CEPR Discussion Paper No. DP12536. London: Centre for Economic Policy Research.
- Gutiérrez, Germán, and Thomas Philippon. 2018. *How EU Markets Became More Competitive than US Markets: A Study of Institutional Drift*. NBER Working Paper 24700. Cambridge, MA: National Bureau of Economic Research.
- Hamilton, Alexander. [1791] 1966. Report on Manufacturers. In *The Papers of Alexander Hamilton, December 1791–January 1792* 10, ed. Harold C. Syrett: 230–340. New York: Columbia University Press.
- Haucap, Justus, Alexander Rasch, and Joel Stiebale. 2019. How Mergers Affect Innovation: Theory and Evidence. *International Journal of Industrial Organization* 63 (March): 283–325.
- Heilperin, Michael A. 1960. *Studies in Economic Nationalism*. Geneva: L'Institut Universitaire de Hautes Études Internationales.
- Hellwig, Martin. 2018. Germany and the Financial Crises 2007–2017. Available at www.riksbank.se/globalassets/media/konferenser/2018/germany-and-financial-crisis-2007-2017.pdf.
- Hieronymi, Otto. 1980. *The New Economic Nationalism*. Geneva: Battelle Geneva Research Center.
- Imbs, Jean, and Romain Wacziarg. 2003. Stages of Diversification. *American Economic Review* 93, no. 1: 63–86.
- Irwin, Douglas A. 2017. *Clashing over Commerce: A History of US Trade Policy (Markets and Governments in Economic History)*. Chicago: University of Chicago Press.
- Johnson, Alvin. 1917. The Passing of Economic Nationalism. *Harper's Magazine* 135, no. 806 (July): 221–25.
- Johnson, Harry G., ed. 1967. *Economic Nationalism in Old and New States*. London: Allen & Unwin.
- Körner, Tobias, and Isabel Schnabel. 2013. *Abolishing Public Guarantees in the Absence of Market Discipline*. Ruhr Economic Paper 437. Essen: Rheinisch-Westfälisches Institut für Wirtschaftsforschung.
- Krugman, Paul R. 1987. Is Free Trade Passé? *Journal of Economic Perspectives* 1, no. 2: 131–44.
- Krugman, Paul R. 1989. Industrial Organization and International Trade. In *Handbook of Industrial Organization* 2, 1179–223, ed. Richard Schmalensee and Robert Willig. Amsterdam: North-Holland Press.
- Krugman, Paul R. 1994. Competitiveness: A Dangerous Obsession. *Foreign Affairs* 73, no. 2: 28–44.
- Lardy, Nicholas. 2019. *The State Strikes Back: The End of Economic Reform in China?* Washington: Peterson Institute for International Economics.
- List, Friedrich. 1841. *Das Nationale System der Politischen Ökonomie*. Stuttgart: J.G. Cotta Verlag.
- McBride, James, and Andrew Chazky. 2018. *Is "Made in China 2025" a Threat to Global Trade?* Council on Foreign Relations Backgrounder (August 2). Available at www.cfr.org/backgrounder/made-china-2025-threat-global-trade.
- Mazzucato, Mariana. 2015. *The Entrepreneurial State: Debunking Public vs. Private Sector Myths*. New York: PublicAffairs.
- Moneta, Alessio, and Elena Stepanova. 2018. *Characterizing Manufacturing Engel Curves around the World*. Inclusive and Sustainable Industrial Development Working Paper WP 14/2018. Vienna: United Nations Industrial Development Organization (UNIDO).
- Monopolkommission. 2004. *Wettbewerbspolitik im Schatten „nationaler Champions“*. Fünfzehntes Hauptgutachten 2002–03.
- Motta, Massimo, and Martin Peitz. 2019. *Competition Policy and European Firms' Competitiveness*. Vox-EU, CEPR Policy Portal, February 20. Available at <https://voxeu.org/content/competition-policy-and-european-firms-competitiveness>.
- Naudé, Wim. 2010. *Industrial Policy*. UNU-WIDER Working Paper 2010/106. Helsinki: United Nations University, World Institute for Development Economics Research.
- Nunn, Nathan, and Daniel Trefler. 2010. The Structure of Tariffs and Long-Term Growth. *American Economic Journal: Macroeconomics* 2, no. 4: 158–94.
- Payosova, Tetyana, Gary Clyde Hufbauer, and Jeffrey J. Schott. 2018. *The Dispute Settlement Crisis in the World Trade Organization: Causes and Cures*. PIIE Policy Brief 18-5. Washington: Peterson Institute for International Economics.
- Petropoulos, Georgios, and Guntram B. Wolff. 2019. What Can the EU Do to Keep Its Firms Globally Relevant? Bruegel Blog, February 15. Available at <http://bruegel.org/2019/02/what-can-the-eu-do-to-keep-its-firms-globally-relevant/>.
- Pilat, Dirk, Agnès Cimper, Karsten B. Olsen, and Colin Webb. 2006. The Changing Nature of Manufacturing in OECD Economies. *OECD Science, Technology and Industry Working Paper 2006/9*. Paris: OECD Publishing.
- Pisano, Gary P., and Willy C. Shih. 2009. Restoring American Competitiveness. *Harvard Business Review* (July–August).
- Pryke, Sam. 2012. Economic Nationalism: Theory, History and Prospects. *Global Policy* 3, no. 3: 281–91.
- Rappard, William E. 1937. Economic Nationalism. In *Authority and the Individual: Harvard Tercentenary Conference of Arts and Science*, 74–112. Cambridge, MA: Harvard University Press.
- Rodrik, Dani. 2004. *Industrial Policy for the Twenty-First Century*. Cambridge, MA: John F. Kennedy School of Government, Harvard University.

Rodrik, Dani. 2008. *Normalizing Industrial Policy*. Working Paper 3. Washington: Commission on Growth and Development.

Rodrik, Dani. 2010. *The Return of Industrial Policy*. Project Syndicate, April 12. Available at www.project-syndicate.org/commentary/the-return-of-industrial-policy?barrier=accesspaylog.

Seabright, Paul. 2005. National and European Champions: Burden or Blessing? *CESifo Forum* 6, no. 2: 52-55.

Südekum, Jens. 2018. The China Shock and the Rise of Robots: Why Germany Is Different. In *Explaining Germany's Exceptional Recovery*, ed. Dalia Marin. London: Centre for Economic Policy Research (CEPR).

Véron, Nicolas. 2005. Comment relancer la politique industrielle? À propos du rapport Beffa. *Commentaire* 110 (Été): 419-29.

Warwick, Ken. 2013. *Beyond Industrial Policy: Emerging Issues and New Trends*. OECD Science, Technology and Industry Policy Paper 2. Paris: OECD Publishing.

Wübbeke, Jost, Mirjam Meissner, Max J. Zenglein, Jaqueline Ives, and Björn Conrad. 2016. *Made in China 2025: The Making of a High-Tech Superpower and Consequences for Industrial Countries*. MERICS Paper on China 2. Berlin: Mercator Institute for China Studies.

Wu, Mark. 2016. The "China, Inc." Challenge to Global Trade Governance. *Harvard International Law Journal* 57, no. 2: 261-324.

Wu, Tim. 2018. *The Curse of Bigness: Antitrust in the New Gilded Age*. New York: Columbia Global Reports.

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