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Trade Effects of Industrial Policies

Are Preferential Agreements a Shield?

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Abstract

This paper explores the effects of industrial policy on trade, focusing on the role of preferential trade agreements. The analysis uses data for the period 2012–2022 on detailed product-level bilateral trade, industrial policy announcements, and rules on subsidies in different preferential trade agreements. The introduction of a new industrial policy measure in a destination market reduces export growth to that market on average by about 0.28 percent. However, exports from fellow members of preferential trade agreements are not adversely affected and may even be positively affected if the agreements have deep disciplines on subsidies. These findings suggest that preferential trade agreements have a shielding effect against the trade distorting effects of industrial policies.

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Trade Effects of Industrial Policies: Are Preferential Agreements a Shield?*

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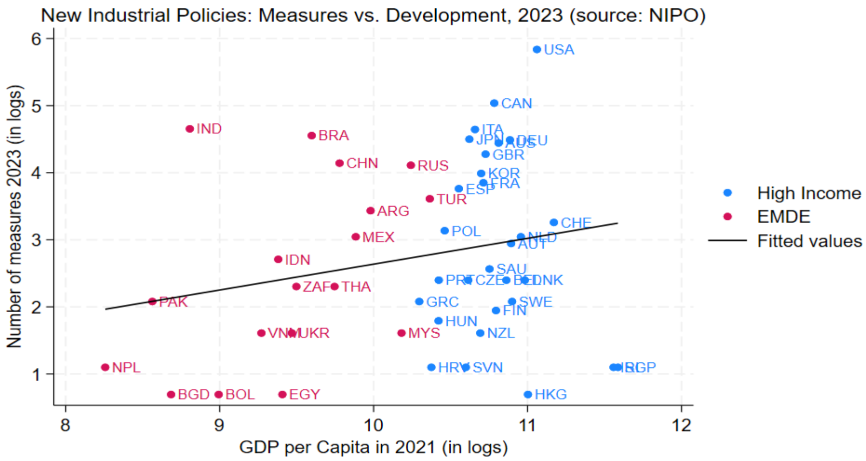
1 Introduction

The global economy is navigating turbulent times, characterized by a surge in industrial policy (IP) and protectionist measures. Our research is motivated by two key observations. First, the number of subsidy-type measures implemented annually has more than tripled since the mid-2010s, and the main users of these measures are the developed and large developing countries, i.e., the members of the G-20 (Figure 1). The "Made in China 2025" program, the US Inflation Reduction Act (IRA) and CHIPS Act, and the European Chips Act are prominent examples of these policies.

Figure 1: **New industrial Policies and GDP per capita**



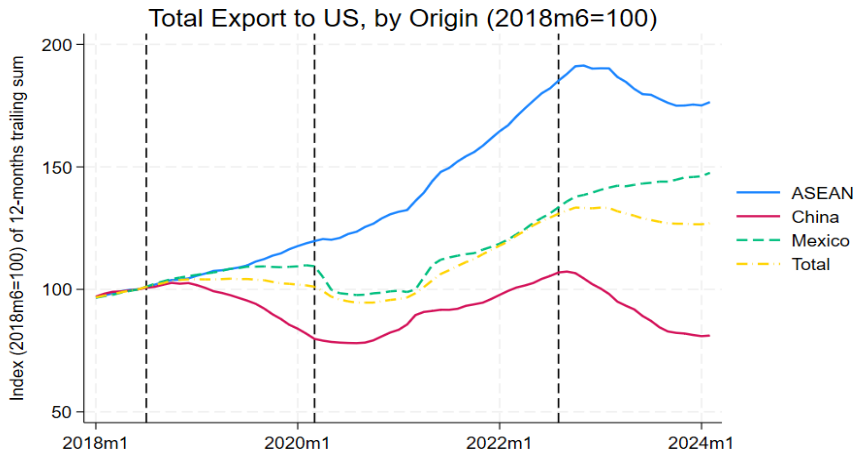
Sources: World Bank (2024), using the NIPO Database (Evenett et al., 2024) and World Development Indicators.
Note: Vertical axis: log of numbers of all potentially trade distortive measures from NIPO. Horizontal axis: GDP per capita in 2021 (from WDI)

The second observation concerns changes in trade patterns following the US Inflation Reduction Act (IRA) of October 2022, which granted subsidies conditional on the use of domestic content. In the period following the IRA, US imports from China and the ASEAN countries declined, while imports from Mexico, which were exempted from these requirements, increased (Figure 2).

We focus on two important questions: How does the implementation of industrial policies by a country affect the exports of its partners? Does sharing a preferential trade agreement with a jurisdiction implementing these measures shield against their potentially distortive trade effects?

Regarding the first question, early empirical research suggested that subsidies may limit market access, hinder industrial development, and slow down economic

Figure 2: **Exports to the US, selected markets**



Sources: Us Census
Notes: Horizontal running lines (colored) show exports to the US from China and ASEAN countries, dashed lines represents exports to the US from Mexico and the World. The data are smoothed by taking a 12-month trailing sum, and indexed to June 2018. The three vertical black lines correspond to the beginning of the trade tensions, the beginning of Covid-19, and August 2022, when the IRA the CHIPS acts were signed.

diversification in trade partners, especially developing countries (Nicita and Rollo, 2015). Recent research suggests that industrial policy measures are positively correlated with both exports and imports of the implementing jurisdiction, but it acknowledges that the analysis may be subject to a selection bias (Rotunno and Ruta, 2024). The second question has not to our knowledge been addressed before. Our work aims to advance the nascent analysis of these issues.

Utilizing data from the Global Trade Alert, we first investigate the impact of industrial polices on trade between countries. From a theoretical standpoint, the effects of industrial policy on trade partners' exports to the implementing jurisdiction are ambiguous, with both positive and negative outcomes possible depending on the design of the policy and the underlying economic structure. Industrial policy can enhance imports from trade partners either by boosting domestic demand (as a consumption subsidy would do) or by fostering the development of industries that complement those abroad (such as those which produce essential inputs). Conversely, industrial policies can negatively impact trade by boosting domestic production (as a production subsidy would) or directly, by discriminating against imports through protective measures such as tariffs, quotas, and stringent standards.

We then investigate how Preferential Trade Agreements (PTAs) influence the impact of industrial policies. Since the second half of the 20th century, PTAs have been a significant feature of global trade, with their scope and depth increasing over the decades. According to the World Trade Organization, 369 regional trade agreements were in force in 2024, up from just 45 in 1995, the year the WTO was established (WTO, 2024). While pre-1995 agreements were primarily focused on reducing tariffs, more recent agreements are considered "deep" because they cover trade and investment in both goods and services as well as intellectual property rights, and a wider set of measures, including subsidies and labor and environmental standards.

When countries are involved in a PTA, the dynamics of how industrial policy affects trade flows can differ, generally fostering more positive outcomes for members. Most pertinently, PTAs can include rules on the types of industrial support allowed and the eligibility conditions (such as local content rules) that can be applied. These rules may alleviate the negative impact of industrial policies on imports from members.

We combine data for the period 2012-2022 on detailed product level bilateral trade, industrial policy (IP) announcements, and rules on subsidies in different PTAs. The econometric analysis controls for various confounding factors, and it yields three main conclusions. First, the introduction of a new industrial policy measure in a destination market reduces export growth to that market on average by about 0.28 percent. Second, exploring the interaction of industrial policy and the existence of a preferential trade agreement, we find that a newly introduced industrial policy measure reduces imports from non-members of a PTA while leaving imports from members of the PTA roughly unchanged. Third, using a measure of the depth of disciplines on subsidies in a PTA, we find that deep disciplines can lead to increased imports from members of a deep trade agreement, effectively making them beneficiaries of industrial policy. For a level of depth equal to that in the top 5 percent of the PTAs in the sample, the introduction of an industrial policy measure increases imports from other members by about 0.39 percent. These effects are robust to alternative econometric specifications, and to the exclusion of potential outliers. We suggest that PTAs provide a shielding effect against the potentially distortive trade effects of discriminatory industrial policies. This shielding effect appears to be heterogeneous across products and regions: it is more pronounced in industries such as chemicals and transport equipment, and for advanced and developing East Asian economies.

Related Literature Our work connects to several strands of the literature. Re- cent papers have studied the measurement of industrial policies and their potential effects.[1] Another strand or work connected to ours explored PTAs and their potential effects.[2]. Third, recent papers have explored the trade effects of subsidies, including those by the WorldBank (2023) and Rotunno and Ruta (2024). Finally, studies have investigated the interconnections between industrial and trade policies. Lashkaripour and Lugovskyy (2023) show that when unilateral adoption of corrective industrial policies is associated with trade barriers, countries risk *immiserizing growth* and a global race to the bottom. Ju et al. (2024) provide a quantitative evaluation of the US-China trade and industrial policy competitions.

The rest of the paper is structured as follows: Section 2 illustrates the data and the empirical specification for the analysis. Section 3 illustrates the main findings. Finally, Section 4 concludes.

2 Data and Empirical Strategy

2.1 Data

We use three different datasets. The dependent variable consists of bilateral, product-level (HS 6-digit) trade data from Comtrade-BACI Gaulier and Zignago (2010), covering the period 2012-2022.[3] There are two key explanatory variables: a measure of new industrial policy announcements as catalogued by the Global Trade Alert database; and measures of preferential trade agreement membership and depth, as documented in the World Bank's Deep Trade Agreements Database (Mattoo et al., 2020).

2.1.1 Global Trade Alert Database

Established in response to the 2008 financial crisis, the Global Trade Alert (GTA) is the only comprehensive database and independent monitoring platform that provides timely information on state measures likely to affect world trade. The database includes measures that are traditionally considered protective, such as tariffs and quotas, as well as subsidies and other mechanisms that governments use to support domestic industries (see Figure 4). The database also classifies the measures into "restrictive" (red), "neutral" (amber) and "liberalizing" (green).

[1] See for instance Kalouptsidi (2018), Criscuolo et al. (2019), Liu (2019), Bartelme et al. (2019), Choi and Levchenko (2021), Juhasz et al. (2022), Lane (2022). Juhasz et al. (2023) offer an extended critical review of the literature.

[2] See for instance Freund and Ornelas (2010), Fernandes et al. (2021), Limao (2006), Limao (2007), Limão (2016),Mattoo et al. (2021), Mattoo et al. (2022), Mattoo et al. (2021) and Romalis (2007)

[3] To eliminate possible distortions from outliers, we exclude bilateral product-level flows accounting for less than USD 1 million yearly. We still cover 96 percent of world trade.

Figure 5 reports the total number of restrictive measures registered between 2003 and 2022, where it is evident that there was a large increase starting in 2020. Figure 6 disentangles the measures into three types: export barriers, import barriers and industrial policies. Clearly, the latter ones are the predominant force leading the total number of measures reported in Figure 5.

The data suggest that measures affecting migration and FDI have also increased, but to a much lesser extent (Figure 7). In terms of instruments of the new protection, export-related measures (P), and non-automatic import restrictions (E) seem to be favored, along with subsidies and other forms of support (L). Import tariffs were progressively reduced until the late 2010s but have seen an increasing trend in the 2020s.

To capture the significance of the new trade restrictions and industrial policy measures, we also investigate the information at the most granular level offered by the Global Trade Alert database. We find that these measures include diverse, finely targeted, and technocratic forms of public support to production and exports, as well as financial guarantees. Unsurprisingly, the measures are mostly implemented by rich countries and some of the larger developing countries. For example, we see a significant increase in the use of export bans and subsidies in ICT and technology.

Table 1 reports two examples that allow understanding the virtues and potential limits of the GTA. Example 1 is an intervention by the US government to support General Motors and Chrysler through a capital injection. The intervention was announced on March 30, 2009, and is recorded as affecting only specific firms. The HS6 products affected by this interventions represent different types of cars (of different cylinder capacities), which, as is well known, are the main final products produced by General Motors and Chrysler. Example 2 reports instead the establishment of a China-backed state fund to promote the domestic integrated circuit industry. The fund was announced in 2014 for a duration of 10 years. The form of the intervention was state loans available to all firms. The HS6 products reported as potentially affected by this intervention include products at different stages of the semiconductor value chains, from the "Machines and apparatus for the manufacture of boules or wafers" (HS code 858610) to the "Processors And Controllers, Electronic Integrated Circuits" (HS code 854231). Examples 1 and 2 illustrate the virtues of a comprehensive cross-country database of rich information about many different aspects of different types of policies. On the other hand, the association of these measures with the potentially affected products is inevitably imperfect. This might introduce significant measurement error in an important explanatory variable of interest.[4]

[4]We consider for our exercise all the measures reported by the GTA for which a set of potentially products is reported. The alternative would be to consider only the interventions directed

2.1.2 Deep Trade Agreements Database

Against the trend of increasing restrictions by the main trading nations, many countries continue to pursue deeper trade integration and international cooperation. Even those countries implementing protectionist measures have continued to discuss, sign and implement "deep" trade agreements, i.e. those agreements that affect domestic policy areas beyond trade, such as the international flows of investment and labor, and the protection of intellectual property rights and the environment. Fortunately, the Deep Trade Agreements (DTA) database reports extensive information on the exact provisions included in each trade agreement signed up to 2023. As many as 61 percent of PTAs that were signed before 1995 covered fewer than 10 policy areas, while in the decade from 2013 to 2023, this figure dropped to just 8 percent.

For our purposes, following the spirit of Mattoo et al. (2022), we are interested in a specific aspect of the "depth" of a preferential trade agreement, namely the extent to which it regulates subsidies. Table 2 reports 12 questions that are included in the DTA database that can be used to construct a suggestive measure of the depth of an agreement with respect to subsidies.[5]. We define the variable PTA_Depth as a measure going from zero to (potentially) one, representing the share of affirmative responses to the 12 questions listed in table 2.[6] The median value of PTA_Depth is 0.16, and the range is from zero to 0.75. Interesting examples include the EU (0.58), CPTPP (0.33), USMCA (0.25), NAFTA (0.16), and RCEP (0.00).

2.2 Empirical Strategy

The dependent variable is the growth rate of trade from origin country i to destination country j of product k (included in sector s) between year t and $t-1$.[7]

to specific firms, with the benefit of isolating better discriminatory measures, but the cost would be excluding important industrial policy episodes such as the establishment of the "Big Fund" in China in 2013.

[5]Examples of these questions are "Does the agreement prohibit or regulate subsidies distorting trade or competition (within domestic, export or third markets)?" or "Does the agreement prohibit or regulate local-content subsidies?"

[6]Formally, we define

$$PTA\_Depth_{ijt} = \frac{\sum_{q=1}^{12} Subsidies\_Coverage_{ijt}^{q}}{12}$$

where $Subsidies\_Coverage^q$ is the q^{th} question in Table 2 referring to the PTA between countries i and j entered into force at time t.

[7]For ease of interpretation, the dependent variable is already multiplied by 100: $\Delta TRADE_{ijk_st} = 100 * (lnEXP_{ijk_s,t} - lnEXP_{ijk_s,t-1})$.

The choice of a specification in growth rates is motivated by two factors. First, the main explanatory variable of interest is a flow measure of newly announced industrial policies, which represent a change rather than a level of protection. Second, using the growth attenuates a potential selection effect of industrial policies targeting larger importer-exporter-product trade flows.

The baseline regression equation can be specified as follows:

$$\Delta TRADE_{ijk_st} = \beta_1 IP_{jkt} + \beta_2 IP_{jkt} * PTA_{ijt} + \beta_3 X_{jkt} + \delta_{ijt} + \delta_{ikt} + \delta_{jk} + \delta_{jst} + \epsilon_{ijk_st} \quad (1)$$

where IP_{jkt} represents a new IP measure potentially affecting product k is implemented in year t by destination country j. PTA_{ijt} is an indicator variable equal to one if a Preferential Trade Agreement is in force at time t between i and j. X_{jkt} includes some controls, specifically whether a new import barrier measure, potentially affecting product k, is implemented in year t by destination country j (IMP_BARR_{jkt}) and its interaction with the variable PTA ($IMP\_BARR_{jkt} * PTA_{ijt}$).

We include a rich series of fixed effects (FE) to control for several potential confounding factors. Specifically, an exporter-importer-time FE (δ_{ijt}) controls for any bilateral factor varying over time. These factors would include for instance exchange rate movements and the establishment of a preferential trade agreement. Note that we are not interested here in assessing the direct impact of PTAs on trade flows, but just their role in mediating the impact of industrial policies. An exporter-product-time FE (δ_{ijt}) controls for any fixed characteristics of an exporter-product pair, such as static comparative advantage, as well as for dynamic elements, such as a change in productivity, the level of market power, domestic demand for specific products, etc. Inserting an importer-product-time FE would not allow us to estimate some of the key coefficients of interest. We therefore control for static importer-product characteristics through an importer-product FE (δ_{jk}) and dynamic sectoral characteristics through an importer-sector-time FE (δ_{jst}), defining sector s as a 2-digit sector from the ISIC classification. At the cost of being unable to identify the coefficient β_1, we show in the appendix that our results on the coefficient β_2 are robust (and in fact stronger) to the inclusion of a more demanding set of controls, including also an importer-product-time FE and exporter-importer-product FE. Finally, in order to study the impact of the depth of trade agreements on the trade effect of industrial policy, Equation 1 is modified as follows:

$$\Delta TRADE_{ijk_st} = \beta_1 IP_{jkt} + \beta_2 IP_{jkt} * PTA\_Depth_{ijt} + \beta_3 X_{jkt} + FE + \epsilon_{ijkst} \quad (2)$$

where $FE = \delta_{ijt} + \delta_{ikt} + \delta_{jk} + \delta_{jst}$ is defined as in equation (1).

3 Results and Discussion

3.1 Results

Figure 3 summarizes in graphical form our main results, which are reported in Table 3 in the appendix. After including our main set of fixed effects, discussed in the previous section, we find that the introduction of a new industrial policy measure in a destination market reduces exports to that market on average by about 0.28%. However, when inserting the interaction term between the industrial policy and the existence of a preferential trade agreement ($IP * PTA$), the coefficient corresponding to non-members of a PTA is negative, statistically significant, and represents an export reduction of about 0.8% while the coefficient corresponding to members of a PTA is small and positive, but not statistically significant. Finally, considering specification (2), the trade effect of IP for a member of a preferential trade agreement will depend also on its depth. Taking a particularly high value of depth, 0.5 (corresponding to the top 5% of PTAs in the sample, in terms of coverage of subsidies), we obtained a combined coefficient which is positive, statistically significant, and corresponds to an increase in exports of about 0.39%. In table 3, we also show that these results are robust to the inclusion of import barriers in the destination countries.[8]

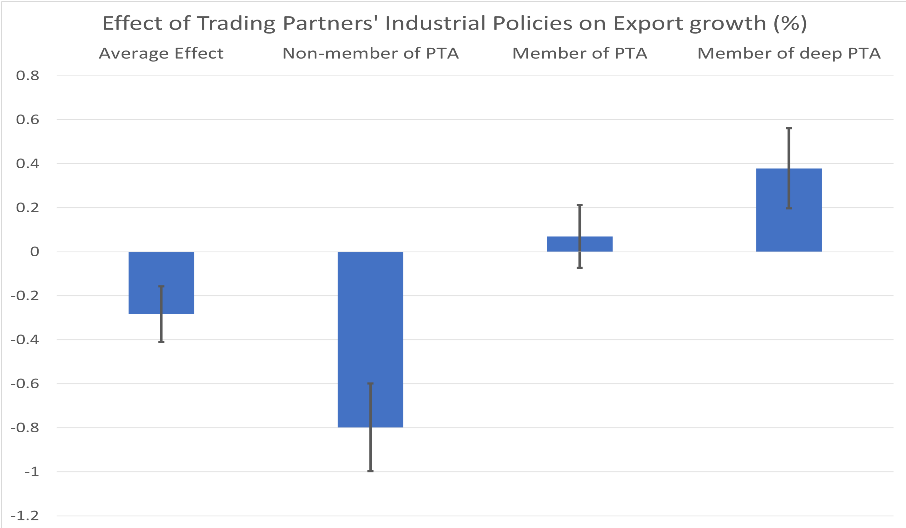
We verified the robustness of our results through several checks. First, we considered an even more stringent specification in terms of fixed effects. By including also an importer-exporter-product (δ_{ijk}) and an importer-product-time FE (δ_{jkt}) we are unable to identify the average effect of the introduction of an industrial policy measure in a trading partner. However, we are still able to identify the interaction terms with the variables PTA and PTA_Depth, which are reported in Table 4 to be positive and highly statistically significant.

Second, we excluded potential outliers from the regressions, defining outliers as those bilateral-product observations experiencing a growth rate of trade lower than −200% or higher than 200%. The results, reported in table 5, are very close to those presented in Table 3.

Third, we explored a case where instead of the growth rate of trade, we use simply the log of the trade level, reported in Table 6. We find again our main result of a negative trade effect of industrial policies for non-members of PTAs and a positive trade effect for members of PTAs and deep PTAs. The coefficients are also larger in size in this case. It is interesting to notice, however, that the average trade effect appears now to be positive and statistically significant. This is in line with the results obtained by Rotunno and Ruta (2024). A potential explanation that they offer for this result is the self-selection of industrial policy

[8] In fact, on average, the imposition of a trade barrier is correlated to a reduction of trade growth by about 0.6%.

Figure 3: **Baseline Results**



Sources: Authors' elaborations.
Note: the average effect is reporting the coefficient in column m1 of Table 3. The effect for non-member of PTA reports the coefficient on variable IP from the column m2 in Table 3. The effect for member of PTA reports the sum of the coefficients on IP and IP_PTA in column m2 of Table 3. The effect for a deep trade agreement is obtained by summing the coefficients on IP and IP_PTA_Depth in column m5 of Table 3, and assuming a value of PTA_Depth of 0.5, corresponding to the 95^{th} percentile of the distribution.

measures into the larger trade linkages.

The exercise proposed here and the one presented by Rotunno and Ruta (2024) (RR) are related, but different. While our main interest is in the interaction between industrial policies and preferential trade agreements, (RR) focus on the effects of industrial policies on total imports and exports of the policy-imposing countries. The two exercises differ also in several empirical choices making it difficult to compare their results.[9]

We conclude by exploring the potential heterogeneity of the *shielding effect* of preferential trade agreements. Table 7 reports the equivalent of the second and third columns reported in Figure 3, but interacting the coefficients for the different

[9]For instance, (RR) consider policies only if they are directed to specific firms, while we use all policies. In the examples proposed in Table 1, we would use both examples while (RR) only example 1. The timing is also different: (RR) consider an industrial policy to be active in year t if it is announced after July 1st of year $t-1$ and before June 30th of year t, while we consider all the policies announced for a given year t. Moreover, (RR) consider both announcements and removals to build measures of stock, while we use a flow measure of the new industrial policies announced. Finally, connected to the previous point, we prefer to use as baseline a specification expressed in growth rates, while (RR) consider deviations from a country-product linear trend.

world regions (except the high-income countries, which are included not in their respective regions but in the single category of advanced economies). As the table shows, the shielding effect appears to be most pronounced for the advanced economies and the developing East Asian economies. Finally, table 8 reports the heterogeneity across sectors. The *shielding effect* here seems to be stronger in industries such as the manufacture of chemicals, metals and transport equipment.

3.2 Discussion

Several reasons could explain our results. First, PTAs typically lower bilateral tariff - and sometimes non-tariff - trade barriers and increase market access, which can counterbalance some of the protectionist effects of industrial policies.

Second, if industrial policies can be tailored to take advantage of the increased market access provided by PTAs, and these focus on sectors where the countries have complementary strengths, this can lead to a virtuous cycle of growth and integration within these sectors and for the countries in a PTA agreement. Third, when they are deep, PTAs also include regulatory harmonization or mutual recognition of standards, which further lessens the negative impacts of strict domestic standards on trade partners' exports. Similarly, PTAs can mitigate the adverse effect of industrial policies by reducing trade distortions and establishing mechanisms to resolve trade disputes, thus helping to manage and mitigate conflicts that could otherwise damage trade relations. Finally, alignment of policies across trade partners also matters. When PTAs include specific provisions relevant to particular industries, and if industrial policies are informed by these provisions, they can enhance the underlying sectors without disrupting trade flows. The alignment of policies is also crucial in another respect: the overall impact of a country's industrial policy on trade partners within a PTA depends significantly on how well these policies align with the shared goals of the agreement. If both countries prioritize similar industrial objectives, such as carbon emission reduction and sustainable development, digital infrastructure building, or innovation, the policies can be designed to mutually benefit rather than compete.

In conclusion, the above considerations suggest that the presence of a Preferential Trade Agreement may encourage a more collaborative approach to industrial policy between member countries, leading to an overall positive effect on bilateral trade flows by facilitating access, harmonizing standards, and reducing the tendency towards protectionist measures within the PTA.

4 Conclusions

Our work has highlighted two sets of concerns about muscular industrial policy action by globally significant economies. First, we confirm a conventional concern that subsidies limit access to markets. When these markets are large, the repercussions are likely to be global and the negative effects cannot be avoided by exporters. Two decades ago, agricultural subsidies in large developed markets provoked the most concern. Now we also need to consider the implications of industrial subsidies for industrial development and economic diversification in trade partners, especially developing countries.

Second, we identify a new concern arising from the combination of industrial policy and PTAs. Non-members of PTAs already faced the cost of exclusion, as PTAs preferentially reduced explicit trade barriers like tariffs through reciprocal liberalization and implicit barriers like technical regulations through mutual recognition and harmonization. Now, exporters from non-member states are further disadvantaged relative to producers within the PTAs that are shielded from the adverse impact of industrial policies. In fact, producers in all PTA members may benefit from subsidies in one member if value added in any member can help meet "local content" eligibility conditions. Non-member countries may therefore lose further market share in PTA regions, even if their goods or services are competitively priced and of higher quality compared to those produced within the PTAs.

A broader concern is about the likely evolution of the global trading system. The synergy between PTAs and proactive industrial strategies could create a more insular and protectionist global trading environment clustered in blocs. The blocs may prioritize internal economic goals over global trade norms and set higher barriers that further isolate non-members. As these trade blocs become more self-sufficient and less reliant on external trade, those outside may find fewer opportunities for export growth and diversification. Furthermore, non-members may be compelled to engage in less favorable trade negotiations or to adopt retaliatory measures, thereby escalating global trade tensions and undermining the stability of the international trade system.[10]

This scenario, which underscores both the disparity in bargaining power and the broader implications for global trade dynamics and the stability of a peaceful international economic order, calls for additional research on these topics.

Importantly, future research should aim to address at least three issues. First, the availability of more granular data would overcome the limitations of the currently available datasets.[11] Second, it is important to address more convincingly

[10] See Gopinath et al. (2024) for a description of the similarities and differences between the current international situation and the Cold War.

[11] Banares-Sanchez et al. (2023) and Bastos et al. (2024) offer examples of promising new data

the potential endogeneity of the industrial policy measures.[12] Finally, better data and more refined methodologies should also be directed at investigating channels so far unexplored, such as the role played by global value chains and production networks in the propagation of the trade effects of industrial policies.

sources.

[12]A recent article by Barattieri and Cacciatore (2023) explores the employment effects of trade protection through the production networks, and proposes an empirical strategy to identify sectoral trade policy shocks. Applying a similar methodology to industrial policies represents a potentially fruitful venue for future investigation.

References

Banares-Sanchez, I., Burgess, R., Laszlo, D., Simpson, P., Reenen, J. V., and Wang, Y. (2023). Ray of hope? china and the rise of solar energy. mimeo.

Barattieri, A. and Cacciatore, M. (2023). Self-Harming Trade Policy? Protectionism and Production Networks. *American Economic Journal: Macroeconomics*, 15(2):97–128.

Bartelme, D., Costinot, A., Donaldson, D., and Rodriguez-Clare, A. (2019). The Textbook Case for Industrial Policy: Theory Meets Data.

Bastos, P., Greenspon, J., Stapleton, K., and Taglioni, D. (2024). Did the 2022 global energy crisis accelerate the diffusion of low carbon technologies? World bank policy research w.p. 10777, may 2024.

Choi, J. and Levchenko, A. A. (2021). The Long-Term Effects of Industrial Policy. NBER Working Papers 29263, National Bureau of Economic Research, Inc.

Criscuolo, C., Martin, R., Overman, H. G., and Reenen, J. V. (2019). Some Causal Effects of an Industrial Policy. *American Economic Review*, 109(1):48–85.

Evenett, S., Jakubik, A., Martín, F., and Ruta, M. (2024). The return of industrial policy in data. IMF Working Papers.

Fernandes, A. M., Rocha, N., and Ruta, M., editors (2021). *The Economics of Deep Trade Agreements*. World Bank.

Freund, C. and Ornelas, E. (2010). Regional trade agreements. *Annual Review of Economics*, 2(Volume 2, 2010):139–166.

Gaulier, G. and Zignago, S. (2010). Baci: International trade database at the product-level. the 1994-2007 version. Working Papers 2010-23, CEPII.

Gopinath, G., Gourinchas, P.-O., Presbitero, A. F., and Topalova, P. (2024). Changing global linkages: A new cold war? IMF Working Papers 24/76.

Ju, J., Ma, H., Wang, Z., and Zhu, X. (2024). Trade wars and industrial policy competitions: Understanding the US-China economic conflicts. *Journal of Monetary Economics*, 141(C):42–58.

Juhasz, R., Lane, N., Oehlsen, E., and Pérez, V. C. (2022). The Who, What, When, and How of Industrial Policy: A Text-Based Approach. SocArXiv uyxh9, Center for Open Science.

Juhasz, R., Lane, N. J., and Rodrik, D. (2023). The new economics of industrial policy. Working Paper 31538, National Bureau of Economic Research.

Kalouptsidi, M. (2018). Detection and Impact of Industrial Subsidies: The Case of Chinese Shipbuilding. *The Review of Economic Studies*, 85(2):1111–1158.

Lane, N. (2022). Manufacturing revolutions: Industrial policy and industrialisation in south korea. *Quarterly Journal of Economics*.

Lashkaripour, A. and Lugovskyy, V. (2023). Profits, Scale Economies, and the Gains from Trade and Industrial Policy. *American Economic Review*, 113(10):2759–2808.

Limao, N. (2006). Preferential trade agreements as stumbling blocks for multilateral trade liberalization: Evidence for the united states. *American Economic Review*, 96(3):896–914.

Limao, N. (2007). Are Preferential Trade Agreements with Non-trade Objectives a Stumbling Block for Multilateral Liberalization? *The Review of Economic Studies*, 74(3):821–855.

Limão, N. (2016). Chapter 6 - preferential trade agreements. volume 1 of *Handbook of Commercial Policy*, pages 279–367. North-Holland.

Liu, E. (2019). Industrial Policies in Production Networks. *The Quarterly Journal of Economics*, 134(4):1883–1948.

Mattoo, A., Mulabdic, A., and Ruta, M. (2022). Trade creation and trade diversion in deep agreements. *Canadian Journal of Economics/Revue canadienne d'économique*, 55(3):1598–1637.

Mattoo, A., Rocha, N., and Ruta, M. (2020). *Handbook of Deep Trade Agreements*. Number 34055 in World Bank Publications - Books. The World Bank Group.

Mattoo, A., Rocha, N., and Ruta, M. (2021). Why deep trade agreements may shape post-covid-19 trade. In Fernandes, A. M., Rocha, N., and Ruta, M., editors, *The Economics of Deep Trade Agreements*, chapter 16. World Bank.

Nicita, A. and Rollo, V. (2015). Market access conditions and sub-saharan africa's exports diversification. *World Development*, 68:254–263.

Romalis, J. (2007). NAFTA's and CUSFTA's Impact on International Trade. *The Review of Economics and Statistics*, 89(3):416–435.

Rotunno, L. and Ruta, M. (2024). Trade spillovers of domestic subsidies. IMF Working Papers. Accessed: 2024-04-15.

WorldBank (2023). *Unfair Advantage: Distortive Subsidies and Their Effects on Global Trade*. The World Bank Group.

WTO (2024). Regional trade agreements information system. Technical report. Accessed: 2024-04-15.

A Charts and Tables

A.1 Data and Stylized facts

Figure 4: **Global Trade Alert Classification, Chapters**

Classification of non-tariff measures by chapter

Imports	Technical measures	A	Sanitary and phytosanitary measures
		B	Technical barriers to trade
		C	Pre-shipment inspection and other formalities
	Non-technical measures	D	Contingent trade-protective measures
		E	Non-automatic import licensing, quotas, prohibitions, quantity-control measures and other restrictions not including sanitary and phytosanitary measures or measures relating to technical barriers to trade
		F	Price-control measures, including additional taxes and charges
		G	Finance measures
		H	Measures affecting competition
		I	Trade-related investment measures
		J	Distribution restrictions
		K	Restrictions on post-sales services
		L	Subsidies and other forms of support
		M	Government procurement restrictions
		N	Intellectual property
		O	Rules of origin
	Exports	P	Export-related measures

Figure 5: **Number of new restrictions, 2009-2023**

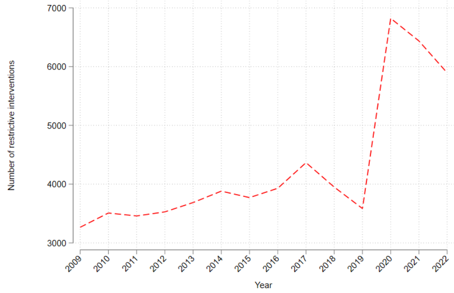


Figure 6: **Breakdown in industrial policies, import and export restrictions**

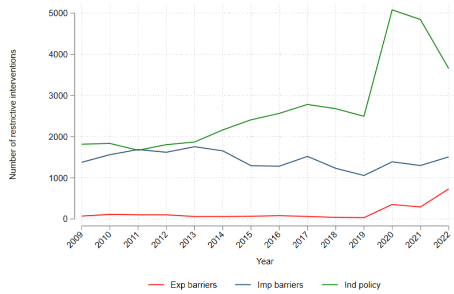
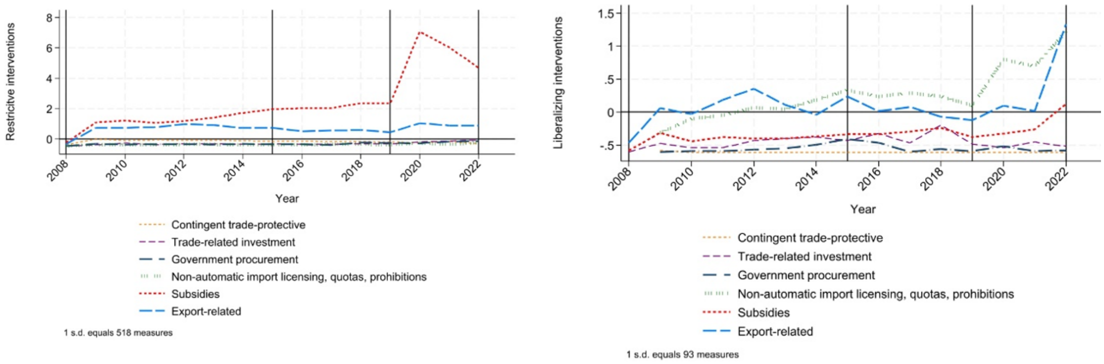


Figure 7: **Restrictive and liberalizing measures, by trade policy instrument**



Source: Global Trade Alert
Note: The y-axis shows standardized measures by type (restrictive or red; and liberalizing or green), i.e. the deviation from average interventions by type (i.e. restrictive or liberalizing) over the entire period 2008-2022. The lines illustrate various types of non-tariff measures. Other typologies of measures reported in the GTA have been omitted from the chart because changes over time are of second order importance. Restrictive subsidies are mainly composed of financial grants, state loans, loan guarantees, price stabilisation measures, and production subsidies. Liberalizing measures are mainly composed of price stabilisation measures, tax or social insurance reliefs, and import incentives.

Table 1: **2 Examples from the Global Trade Alert**

	Example #1	**Example #2**
Implementing Jurisdiction	United States of America	China
ID	127561	410148
State Act ID	274	67744
Intervention ID	16042	108763
State Act Title	Support for General Motors and Chrysler	State-backed fund to promote domestic integrated circuit industry established
Announcement Date	2009-03-30	2014-10-14
Inception Date	2009-03-30	2014-10-14
Removal Date	N/A	2023-10-13
Currently in force	Yes	Yes
Implementation Level	National	National
Eligible Firms	firm-specific	all
Intervention Type	Capital injection and equity stakes (including bailouts)	State loan
MAST chapter	L Subsidies (excluding export subsidies)	L Subsidies (excluding export subsidies)
Affected Products (HS6)	870210, 870321, 870322, 870323, 870324, 870332, 870333, 870390, 870410, 870421, 870422	848610, 848620, 848630, 848640, 848690, 854231, 854232, 854233, 854239, 854290

Source: Global Trade Alert

Table 2: **Selected questions on subsidies in the Deep Trade Agreement Database**

1	Does the agreement prohibit or regulate export subsidies?
2	Does the agreement prohibit or regulate local-content subsidies?
3	Does the agreement prohibit or regulate subsidies distorting trade or competition (within domestic, export or third markets)?
4	Does the agreement introduce any ceiling to permitted subsidies?
5	Does the agreement introduce any de minimis threshold for permitted subsidies?
6	Does the agreement include any specific regulation of agricultural subsidies?
7	Does the agreement include any specific regulation of fisheries subsidies?
8	Does the agreement include any specific discipline for public services?
9	Does the agreement include any other specific discipline for certain sectors or objectives?
10	Does the agreement include any national treatment obligation (goods) for subsidies?
11	Does the agreement include any national treatment obligation (services or establishment) for subsidies?
12	Does the agreement include any national treatment obligation (investment) for subsidies?

Source: Deep Agreements Database

A.2 Empirical Results

Table 3: **Baseline results**

	m1	m2	m3	m4	m5	m6
IP	-0.283**	-0.798***	-0.262**	-0.741***	-0.773***	-0.726***
	(0.126)	(0.200)	(0.126)	(0.198)	(0.196)	(0.195)
IP_PTA		0.868***		0.792***		
		(0.226)		(0.225)		
IMP_BARR			-0.595***	-1.449***		-1.452***
			(0.134)	(0.196)		(0.196)
IMP_BARR_PTA				1.520***		1.523***
				(0.242)		(0.242)
IP_PTA_Depth					2.304***	2.143***
					(0.575)	(0.572)
EXP-IMP-year FE	Yes	Yes	Yes	Yes	Yes	Yes
EXP-HS6-year FE	Yes	Yes	Yes	Yes	Yes	Yes
IMP-HS6 FE	Yes	Yes	Yes	Yes	Yes	Yes
IMP-ISIC_2-year FE	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.244	0.244	0.244	0.244	0.244	0.244
N	8,474,619	8,474,619	8,474,619	8,474,619	8,474,619	8,474,619

Dependent Variable: $\Delta TRADE_{ijk_st}$. IP: A new industrial policy measure is introduced by destination country j at time t potentially affecting product k. IMP_BARR: A import restrictive policy measure is introduced by destination country j at time t potentially affecting product k. *, **, *** represent coefficient statistically significant at 10%, 5% and 1%. Standard Errors are clustered at importer-exporter level.

Table 4: **Robustness: a more demanding specification**

	m1	m2	m3	m4
IP_PTA	1.188***	1.137***		-0.056
	(0.343)	(0.343)		(0.613)
IMP_BARR_PTA		1.436***		1.434***
		(0.309)		(0.309)
IP_PTA_Depth			3.859***	3.865**
			(0.927)	(1.655)
EXP-IMP-year FE	Yes	Yes	Yes	Yes
EXP-HS6-year FE	Yes	Yes	Yes	Yes
IMP-HS6-year FE	Yes	Yes	Yes	Yes
IMP-EXP-HS6 FE	Yes	Yes	Yes	Yes
R-squared	0.470	0.470	0.470	0.470
N	7,258,047	7,258,047	7,258,047	7,258,047

Dependent Variable: $\Delta TRADE_{ijk_st}$. *, **, *** represent coefficient statistically significant at 10%, 5% and 1%. Standard Errors are clustered at importer-exporter level.

Table 5: **Robustness: excluding potential outliers (Trade Growth** $> 200\%$ **or** $< -200\%$**)**

	m1	m2	m3	m4	m5	m6
IP	-0.284***	-0.748***	-0.266**	-0.696***	-0.749***	-0.707***
	(0.107)	(0.165)	(0.107)	(0.164)	(0.162)	(0.160)
IP_PTA		0.781***		0.711***		
		(0.193)		(0.192)		
IMP_BARR			-0.533***	-1.321***		-1.323***
			(0.119)	(0.173)		(0.173)
IMP_BARR_PTA				1.401***		1.401***
				(0.215)		(0.215)
IP_PTA_Depth					2.180***	2.031***
					(0.489)	(0.486)
EXP-IMP-year FE	Yes	Yes	Yes	Yes	Yes	Yes
EXP-HS6-year FE	Yes	Yes	Yes	Yes	Yes	Yes
IMP-HS6 FE	Yes	Yes	Yes	Yes	Yes	Yes
IMP-ISIC_2-year FE	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.248	0.248	0.248	0.248	0.248	0.248
N	8,356,523	8,356,523	8,356,523	8,356,523	8,356,523	8,356,523

Dependent Variable: $\Delta TRADE_{ijk_st}$. IP: A new industrial policy measure is introduced by destination country j at time t potentially affecting product k. IMP_BARR: A import restrictive policy measure is introduced by destination country j at time t potentially affecting product k. *, **, *** represent coefficient statistically significant at 10%, 5% and 1%. Standard Errors are clustered at importer-exporter level.

Table 6: **Robustness: Regressions on (log) Levels of Trade**

	m1	m2	m3	m4	m5	m6
IP	0.565***	-2.529***	0.541***	-2.346***	-1.775***	-1.642***
	(0.133)	(0.533)	(0.133)	(0.525)	(0.384)	(0.378)
IP_PTA		5.297***		4.874***		
		(0.824)		(0.815)		
IMP_BARR			0.728***	-3.396***		-3.443***
			(0.134)	(0.435)		(0.438)
IMP_BARR_RTA				7.451***		7.532***
				(0.665)		(0.669)
IP_PTA_Depth					11.176***	10.232***
					(1.646)	(1.622)
EXP-IMP-year FE	Yes	Yes	Yes	Yes	Yes	Yes
EXP-HS6-year FE	Yes	Yes	Yes	Yes	Yes	Yes
IMP-HS6 FE	Yes	Yes	Yes	Yes	Yes	Yes
IMP-ISIC_2-year FE	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.650	0.650	0.650	0.650	0.650	0.650
N	9,810,196	9,810,196	9,810,196	9,810,196	9,810,196	9,810,196

Dependent Variable: 100*Ln(trade). IP: A new industrial policy measure is introduced by destination country j at time t potentially affecting product k. IMP_BARR: A import restrictive policy measure is introduced by destination country j at time t potentially affecting product k. *, **, *** represent coefficient statistically significant at 10%, 5% and 1%. Standard Errors are clustered at importer-exporter level.

Table 7: **Heterogeneity across regions**

	IP	IP*PTA
Advanced Economies	-0.701***	0.830***
	-0.243	-0.271
East Asia & Pacific	-1.192***	1.613**
	-0.369	-0.693
Europe & Central Asia	-0.637	0.372
	-1.007	-1.142
Latin America & Caribbean	0.848	-2.244*
	-1.194	-1.36
Middle East & North Africa	-0.446	-0.572
	-2.333	-2.825
South Asia	-0.493	0.92
	-0.837	-1.249
Sub-Saharan Africa	-2.421	0.174
	-1.752	-2.447
EXP-IMP-year FE		Yes
EXP-HS6-year FE		Yes
IMP-HS6 FE		Yes
IMP-ISIC_2-year FE		Yes
R-squared		0.244
N		8,309,200

Dependent Variable: $\Delta TRADE_{ijk_st}$. IP: A new industrial policy measure is introduced by destination country j at time t potentially affecting product k. *, **, *** represent coefficient statistically significant at 10%, 5% and 1%. Standard Errors are clustered at importer-exporter level.

Table 8: **Heterogeneity across sectors**

ISIC	Sector Description	IP	IP_PTA
15	Manufacture of food products and beverages	-0.954*	0.184
		-0.536	-0.542
16	Manufacture of tobacco products	0.092	-1.391
		-8.666	-7.595
17	Manufacture of textiles	-1.079	2.909***
		-0.79	-0.842
18	Manufacture of wearing apparel; dressing and dyeing of fur	-0.264	2.207*
		-0.929	-1.134
19	Tanning and dressing of leather; manufacture of luggage, handbags etc	-0.587	3.546**
		-1.476	-1.409
20	Manufacture of wood and of products of wood and cork, except furniture	1.288	1.13
		-1.331	-1.624
21	Manufacture of paper and paper products	-0.81	0.105
		-1.092	-0.999
22	Publishing, printing and reproduction of recorded media	0.307	-1.217
		-1.955	-2.052
23	Manufacture of coke, refined petroleum products and nuclear fuel	-0.058	1.258
		-3.734	-3.132
24	Manufacture of chemicals and chemical products	-1.072***	1.458***
		-0.391	-0.444
25	Manufacture of rubber and plastics products	-1.211**	0.432
		-0.563	-0.514
26	Manufacture of other non-metallic mineral products	-0.442	0.599
		-0.817	-0.853
27	Manufacture of basic metals	-1.327*	2.198***
		-0.747	-0.769
28	Manufacture of fabricated metal products, except machinery and equipment	-1.871***	1.583**
		-0.7	-0.797
29	Manufacture of machinery and equipment n.e.c.	-0.017	-0.252
		-0.438	-0.441
30	Manufacture of office, accounting and computing machinery	1.539	0.673
		-1.472	-1.084
31	Manufacture of electrical machinery and apparatus n.e.c.	0.147	0.208
		-0.532	-0.532
32	Manufacture of radio, television and communication equipment and apparatus	0.281	0.942
		(0.797)	(0.885)
33	Manufacture of medical, precision and optical instruments	-2.644***	2.262***
		(0.576)	(0.603)
34	Manufacture of motor vehicles, trailers and semi-trailers	-2.569***	1.414*
		(0.929)	(0.776)
35	Manufacture of other transport equipment	-1.445	3.871***
		(1.352)	(1.409)
EXP-IMP-year FE			Yes
EXP-HS6-year FE			Yes
IMP-HS6 FE			Yes
IMP-ISIC_2-year FE			Yes
R-squared			0.244
N			8,474,619

Dependent Variable: $\Delta TRADE_{ijk_st}$. IP: A new industrial policy measure is introduced by destination country j at time t potentially affecting product k. *, **, *** represent coefficient statistically significant at 10%, 5% and 1%. Standard Errors are clustered at importer-exporter level.