Economic and Environmental Effects of Industrial Policy Nationalism

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SUMMARY

The objective of this study is to gain a deeper insight on the implications of industrial policy nationalism and its impact on economic development, trade flows, and climate action. Three alternative scenarios of trade and climate policies with a focus on green industries are developed and examined with the use of the leading macroeconomic model GEM-E3 with the appropriate sectoral and regional granularity. The scenario results are compared in terms of macroeconomic, trade, and sectoral indicators to identify key policy-relevant findings and we illustrate that industrial policy nationalism hurts the economy with limited benefits in terms of reduced green technology import dependence. We show that a green technology race should be based on a collaborative spirit, as geopolitical rivalry may thwart climate action and sustainable economic development.

EXTENDED ABSTRACT

The crises over the last few years have led to increased attention to security issues by companies and governments. Three major factors are currently influencing the global industrial scene: i) concern over security of the supply chain due to backlogs during the COVID pandemic [1], ii.) uncertainty related to energy supply security highlighted by Russia's use of energy trade as a war strategy [2] and iii.) competition among industrialized countries to seize industrial and technological opportunities that arise from the climate transformation required for climate change mitigation [3].

The leading industrial economies, in response to the aforementioned trends, have recently launched and adopted policies to protect domestic industrial production and support strategic investments especially in green industries. Industrial policy nationalism is defined as a political strategy of prioritizing development of domestic green industries and protecting them from or supporting them in the face of external competition. The competition among industrial powerhouses for innovation and development of green technologies and the related policies have resulted to a growing concern regarding potential rivalries and industrial nationalism, which may increase the transition costs and thwart the overall transformation progress towards meeting Paris goals [5]. Indicatively, such policies and pledges include the Inflation Reduction Act (US), the Net Zero Industry Act and Carbon Border Adjustment Mechanism (EU), the "Made in China 2025" and Dual Circulation Strategy (CN), Production Linked Incentive (IN) and the Green Transformation Act (JP).

To better understand the impacts of industrial nationalistic policies on economic development, trade. and import dependence and the implications on climate action, three alternative scenarios with different trade and climate policies were established and executed with the leading macroeconomic model, GEM-E3 [4]. The model has been enhanced with a bottom-up representation of energy sectors and a representation of manufacturing and trade of clean energy technologies and their value chains. The three alternative scenarios along with the baseline (status quo) scenario and their key differences are presented in Table 1.

Table 1*: Overview of key differences in scenario assumptions*

	Status quo ante (baseline)	**Strong Industrial Policy Nationalism (sIPN)**	**Weak Industrial Policy Nationalism (wIPN)**	**Transatlantic Friendshoring (TF)**
Mitigation Ambition	NDCs for 2030, long-term national net-zero targets (if available)	Same climate policies implemented as in the Status quo ante scenario		

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<table>
<tr><th></th><th>Status quo ante (baseline)</th><th>Strong Industrial Policy Nationalism (sIPN)</th><th>Weak Industrial Policy Nationalism (wIPN)</th><th>Transatlantic Friendshoring (TF)</th></tr>
<tr><td>Trade relations between five industrial leaders</td><td>No restrictions/ continuation of current trade policies</td><td colspan="2">Impose import duties/tariffs to increase the imported price by 50% between five leading (EU, US, CN, IN, JP regions) in
● Clean energy technologies (incl. solar, wind, EV, batteries)
● lithium
● steel
● aluminium
● copper
● rare earth materials
● cars
● chemicals</td><td>Same as in wIPN scenarios but no restrictions between US and EU.</td></tr>
<tr><td>Trade relations with rest of the world</td><td>No restrictions/ continuation of current trade policies</td><td>Same duties/tariffs imposed as in trade between leading industrial</td><td colspan="2">No restrictions/ continuation of current trade policies</td></tr>
<tr><td>Use of tariff revenues</td><td>-</td><td colspan="3">Used to subsidise the development of the domestic green technology industries</td></tr>
</table>

The economic and environmental impacts of the trade scenarios, compared to the status quo/ baseline are shown in Figure 1. The alternative trade scenarios result in a 0.4%-1% reduction in the global GDP in 2050 (upper left) which is directly related to trade barriers in clean technologies (including related products), the magnitude of their restrictions and their geographical coverage. The national GDPs of all five major economies (EU, USA, China, India, Japan) that this study focuses on are negatively impacted in all alternative scenarios (upper right) with the most negative impacts faced in the sIPN scenario that imposes the strongest trade barriers. In scenarios with weak industrial policy nationalism, the “Rest of world” countries improve their relative competitiveness as import tariffs are imposed only on the five major economies and thus increase their industrial activity and GDP. South Korea has already established strong PV and battery manufacturing capacities and can benefit from increased competitiveness and production registering much larger GDP gains in wIPN and TF scenarios compared to other countries.

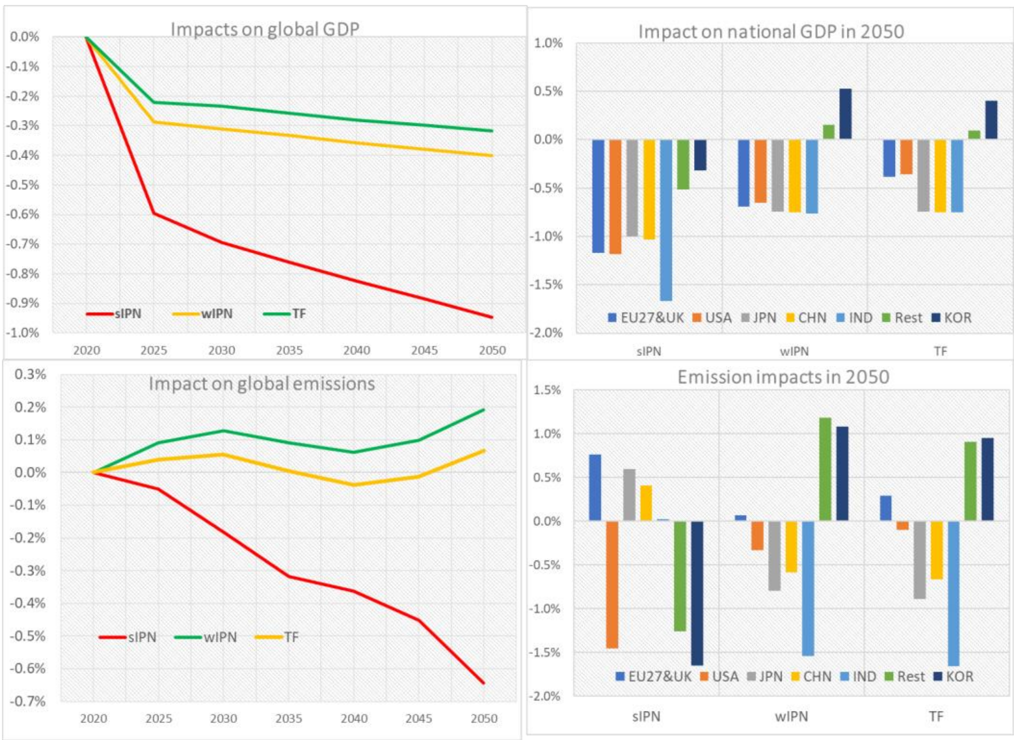

Figure 1: Economic and emission impacts of the trade scenarios compared to the status quo baseline.

The imposition of trade tariffs has limited impacts on global emissions (lower left) since strict climate policies and net-zero targets are the main emission drivers and constrain the projections in all scenarios. The negative impact of increased clean technology costs due to trade tariffs is counteracted by the reduced economic activity and the net effect is a reduction of 0.6% in the more restrictive sIPN scenario and a mere increase of 0.1%-0.2% in the other two scenarios. The increase in the two least strict trade scenarios is due to the relocation of industrial production to the “Rest of the World” and South Korea where higher carbon intensity leads to higher emissions for the same level of production. On the national level the effect on emissions is driven again by various opposing factors and countries are affected differently depending on their climate targets, GDP impacts, sectoral production trends, international competitiveness, etc.

The shares of the five major economies and the “Rest of the World” in global manufacturing of clean energy technologies are directly influenced with the imposition of trade tariffs (Figure 2). These effects are different for each country and technology due to different competitive positions and existing infrastructure. Battery production changes significantly across scenarios; in the strict sIPN scenario, a large part of the Chinese (and Japanese) manufacturing is relocated to the EU, USA and India driven by the trade restrictions in these countries. In the other two scenarios (wIPN and TF), battery manufacturing drops in all five major economies to the benefit of the “Rest of world” region, and mostly South Korea, a major player in battery production with established industrial capacities. The trade restriction impacts are limited in production of electric vehicles, as in the “status quo” scenario all major economies cover a large share of their demand with domestically produced EVs. China is projected to dominated in PV manufacturing until 2050, despite the imposition of high trade tariffs and reduced Chinese exports are counterbalanced by exports from the “Rest of the World” due to increased cost efficiency. The imposition of trade tariffs in the wind industry, currently dominated by European and Chinese manufacturers, leads to significant export losses in these countries to the benefit of the USA, which is the only major economy with adequate know-how, labour skills, and financial resources to expand its wind manufacturing.

Figure 2: Share of major economies in global manufacturing of clean energy technologies in 2050.

The imposition of trade tariffs reduces the import dependency of the five leading economies as the increased domestic industrial production of green technologies covers a significant share of the domestic green technology demand by 2050, especially in the sIPN scenario. In the other two scenarios, where trade with the rest of the world is unrestricted, the import dependency of EU, USA and India in terms of green technologies remains high, to the benefit of other technology producers and mainly South Korea.

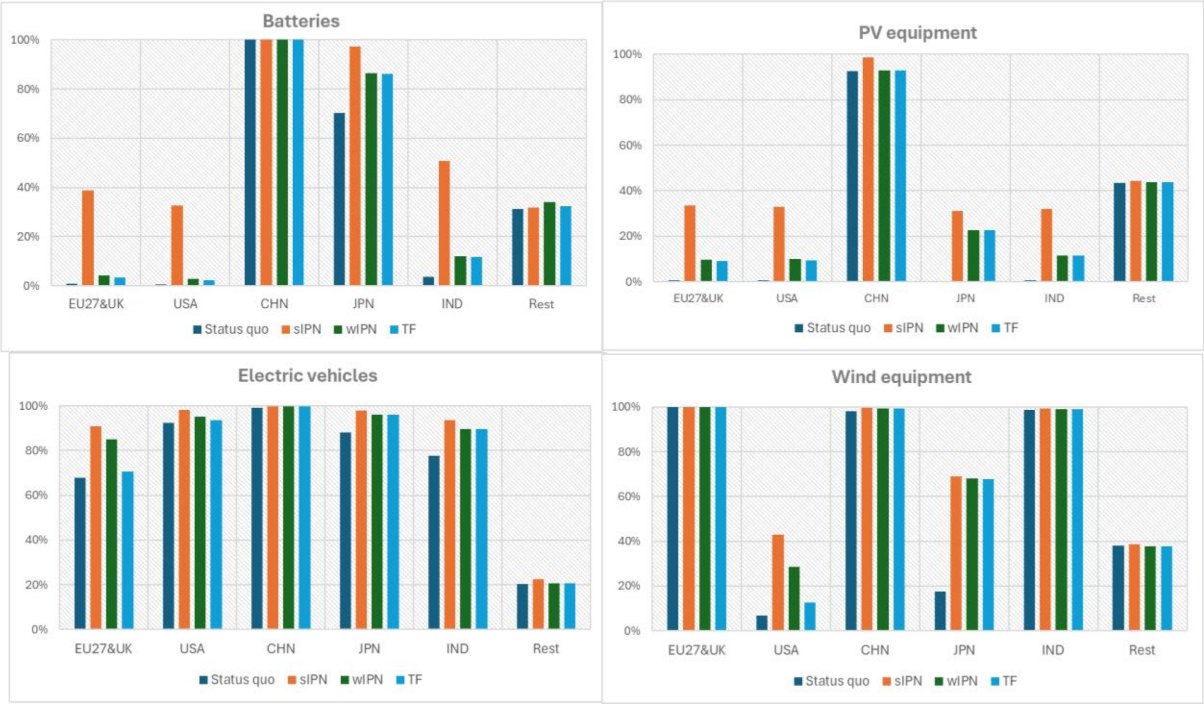

Figure 3: Share of demand for green products covered from domestic production by country and scenario over 2020-2050.

This analysis illustrated that industrial policy nationalism mainly hurts the economy and offers limited benefits in terms of reduced green technology import dependence for major economies. These policies fail to achieve a significant build-up of domestic green production under most assumptions while the imposition of trade tariffs in a restricted number of economies will lead to substitution effects and increased imports from other advanced industrial economies (South Korea). It is important to note that the most restrictive scenario used in this study is still quite optimistic as policies are restricted to limited sectors relevant for the green industry transformation and retaliatory measures could spiral into a much broader trade conflict affecting all sectors. A technology race against climate change is needed and it needs to be a race in a collaborative spirit in which all contestants encourage each other to perform at their best. But a race in the spirit of geopolitical rivalry fuelled by industrial policy nationalism may ultimately make climate action and in particular sustainable development more costly.

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