

Title:

Industrial policies and the competition for low-carbon manufacturing

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Summary:

The low-carbon energy transition sees countries compete about where the low-carbon products are manufactured. In their recent article, Sharma, Surana and George ask whether imposing unilateral anti-dumping tariffs help the imposing country move more of the value chain into its own country and answer in the negative. Their analysis raises larger questions about how industrial policies can help advance the global low-carbon transition.

Body:

How to use industrial policy to catch up to richer and more advanced countries is an old problem in the art of economic governance. Industrial policy aims to give domestic producers an advantage vis-à-vis those in other countries. It enables establishing new industries at home and creating domestic jobs and incomes instead of importing these industries' products thereby depleting precious foreign currency. Such infant-industry protection and import-substitution has involved a variety of activities. Tariffs and quotas are only one set of instruments. Others include subsidies conditional on performance, public investment planning, development banks and many others.¹ Industrial policies have been key to countries' growth and development and with few exceptions today's rich, industrialized countries in Europe and North America have deployed massive industrial policy programs over centuries to catch up with, and overtake, technological leaders. For example, the United States (U.S.) had one of the most powerful infant-industry protection programs throughout the 1800s including very high tariffs. It changed its stance in favor of free trade only after World War Two when it had gained all-round technological leadership.² Those countries in East Asia that emulated European and American activist policies were the most successful growth stories in the 20th century.¹

The problem of technological leadership also presents itself with the new technologies needed for the low-carbon energy transition. The capability to produce and export manufactured hi-tech goods for both low-carbon energy supply and end-use is alluring from the perspective of national economic development. It promises well-paid jobs, income for communities and spill-over effects into other industries and sectors that ensure robust growth and national prosperity,³ often far into the future due to path-dependencies.⁴ Additionally, and this is new, it provides the technological solution to climate change mitigation.

To be clear, industrial policy is not about maximizing the jobs globally needed to ensure the transition. On the contrary, the attempt is to increase labor productivity, which reduces the number of hours worked per unit output, become internationally cost-competitive and so bring

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a larger part of the supply chain of any technology and concomitant jobs into one's own country. In principle, industrial policy could target any set of manufacturing industries. But once the need to mitigate climate change has become a major political goal and the relevant technologies start becoming competitive with high-carbon incumbents, countries need to try and get a foothold in the new, low-carbon sectors so as not to be left out from the global industrial economy of the future.⁵ 'Green' industrial policies are a key mechanism for doing so.

A recent article by Sharma, Surana and George⁶ observes an increase in litigation against such green industrial policies on the grounds that they convey an unfair advantage on the country deploying such policies. The authors ask whether successful litigation and the imposition of retaliatory tariffs leads to more manufacturing jobs in the suing country. This is an important question, not least, as the authors observe, because climate change mitigation policies become politically more accepted when they also generate local, well-paying jobs. Their research also leads to asking two additional questions once one recognizes that litigation and retaliatory tariffs are industrial policies in their own right. First, which industrial policies are effective at the country level and could this depend on the type of country that wields them? And second, what effect could industrial policies in different countries, possibly pitted against each other, have on the global energy transition?

Sharma et al. study the case of U.S. anti-dumping/retaliatory tariffs on imports of Chinese manufactured solar PV and wind turbine products. They investigate several instances in the period 2010-2019 in which the U.S. imposed unilateral tariffs as a result of litigation by U.S. companies arguing that Chinese companies sold their products below cost thanks to Chinese industrial policy. As a result, for most of this period, Chinese solar PV components faced time-varying average tariffs of 25-47% of their export price; wind towers and later also other components faced tariffs above 50%.

The authors find no evidence of an appreciably positive correlation of U.S. manufacturing jobs in the years the retaliatory tariffs were active relative to those when they weren't. They also find no difference in the rate at which solar and wind capacity expanded in the U.S. over these periods. Their method consists of investigating the bivariate correlation between the presence of tariffs and change in the number of manufacturing and total jobs in the solar and wind industries. Somewhat surprisingly, they focus only the years right after tariff imposition, not all years, possibly ignoring longer-term effects. But their results would not change qualitatively over these longer periods. Meantime, their data on solar and wind jobs (provided in an SI) and their detailed citations of sources for and discussions of specific tariffs offer helpful starting points for others trying to do research in this area.

Sharma et al. examine correlations, no causal relationships. Yet, scholars of industrial policies would not be surprised, for theoretical reasons, if their results were confirmed by identifying the causal effect of retaliatory tariffs on jobs. To appreciate this claim, note that an anti-dumping tariff is nothing but an industrial policy itself. Here, it presents an attempt by the country at the technological frontier to prevent others from catching up or overtaking it. There is again nothing new about it. For instance, England restricted emigration of its skilled workers

to prevent other countries from learning from their knowledge in the 18th century.² By placing themselves at the frontier, the leading countries not only get richer but must also pay their affluent citizens adequate wages. As the authors note themselves, solar PV modules and wind towers are nowadays at best mid-tech products and – as the case of China and increasingly other countries such as India shows – a good product in which catching-up developing countries can nurture infant-industries and successfully become exporters themselves. Once they have established themselves in the industry, richer countries, here the U.S., will find it very difficult to stay in the competition as the higher wages structurally advantage the lower wage producers.⁷ Consider that the income per capita in the U.S. was about 7 times higher in 2015 than in China at export-relevant market exchange rates.

The product cycle theory from international economics captures this difference in a stylized way: leading countries must innovate in high-tech products which cannot be produced by following countries, but all of these innovations are eventually learned by other countries. This requires the leading countries to come up with new high-tech products, at least if they want to maintain their superior affluence.⁸ An example from solar PV itself is the more advanced thin-film technology with a higher capacity factor than the imported crystalline-silicon panels and in which at least one U.S. firm is world-leading. One way for the U.S. to foster domestic manufacturing jobs, at least over the short period of a few years which Sharma et al analyze, might have been to tailor some of its industrial policy to favoring the thin-film part of the solar PV market. (This would of course not have helped the crystalline silicon producing companies lobbying the U.S. government for tariffs). The upshot is that whether particular green industrial policies work depends on the context: clearly for China its industrial policy for establishing a mid-tech solar PV industry worked. For a high-wage technology leader like the U.S. another set of policies might work to maintain its edge in the most advanced energy technologies. Yet another set of policies might work for a developing country that is only beginning its transition from a largely agricultural economic base.

One question following from these qualitative differences is what effect industrial policies pitted against each other have on the pace of the global transition to a low-carbon economy. Industrial policy that speeds up innovation in low-carbon sectors is key. In fact there is probably too little of it, given the massive gap between actual investments in low-carbon technologies and those compatible with limiting global warming to 2°C or 1.5°C, predominantly in developing countries.⁹ If retaliatory policies by rich countries were not very effective in general, then such policies would have little effect on the overall pace of technological progress, as countries affected by such policies could largely continue to produce those mid-tech technologies such as crystalline silicon solar PV at the lowest costs in the world and exploit further scale economies and learning by doing. However, if the case by Sharma et al weren't confirmed in general, this could ultimately slow down the transition, especially in rich countries. That's because import substitution is taking place here but – unlike with developing country import-substitution – it is clear that the domestic product will never become competitive internationally on account of the higher wages. Recent evidence confirms that rich countries benefit from trade, but by producing and exporting the most hi-tech or higher quality products that no one else has the capabilities to make.^{10,11} How the scramble to insert oneself into the green value chain also by

rich countries may influence the path and pace of the energy transition is a problem of utmost importance to our understanding of the chances for transitioning the energy system (and confronting other energy and environment-related problems) and deserves more research.

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