Global Political and Economical Realignments — Implications for Brazil

Structured Conversations III

Technological innovation and the digital economy

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Technological Innovation and the digital economy

The Political Economy of Innovation Strategies in the Post-Pandemic World: How to Align Global and Local Priorities?

Introduction

Throughout 2021, the Brazilian Centre for International Relations (CEBRI), with funds from the Konrad Adenauer Foundation (KAS), develops a project on issues related to the realignment of international politics and the global economy, and their implications for Brazil and foreign relations. The project includes events, "structured conversations" (interviews) with experts and the production of documents (policy papers) on four broad topics

> ➢ Realignments and formulation of foreign policy: national and regional spaces and global insertion;
> ➢ Trade and transformations in the international political economy:
> ➢ Technological innovation and the digital economy;
> ➢ Anthropocene crises, sustainability, global health and consensus building for multilateral policies.

These structured conversations contribute to the third topic of the project. A starting point to our discussion is the fact that public policies for sustainable economic growth are synonymous to technological innovation policy, particularly focused on the digital transformation of the economy. While national governments are increasingly deploying industrial strategies to this end ("smart and sustainable industrial policies"), at the global level there is no agreement in place that effectively allows for multilateral regulations, neither of the digital economy, nor to promote environmental sustainability. This is indeed a discussion that is still very fragmented. Against this premise, we want to rethink technological options at the local, national, regional and global levels, as well as the opportunities and constraints that are specific to developing countries like Brazil.

The outbreak of the COVID-19 pandemic complicated the geopolitical arena even more. It made explicit the risk of relying on globalized value chains for essential supplies, be them basic textiles (protective masks) or advanced chemicals (active pharmaceutical ingredients). While "technological sovereignty" has always been a fundamental goal of industrial catching-up strategies (from the United States and Germany in the 18th/19th centuries through the Asian Tigers and Latin American Countries in the 20th to China in

the 21st) and a core concern to classical political economists (from William Petty and Adam Smith to Alexander Hamilton and Fredrich List), the pandemic came as a wake-up call to currently developed nations, challenging the free-market political economy that prevailed at the global arena since the 1970s. Indeed, technological sovereignty is now a top priority in many national governments' agendas, and the Biden plan to re-shore the US industrial base and decouple its value chain from China is the obvious example of this impetus.

The renewed interest in technological sovereignty – a national priority – generates tensions with the agenda of the Sustainable Development Goals (SDG), which addresses many problems that are global in nature. On the one hand, we see the prospects of a new round of protectionist technological strategies and interstate competition; on the other, the SDG agenda calls for a global strategy and technological cooperation. The fact that world leaders failed to coordinate and cooperate to address the COVID-19 pandemic, and instead competed to guarantee, for example, the supply of vaccines to their own countries, shows that even in the face of a common urgent threat, aligning global and local priorities is an elusive task. Under the scenario that unfolds, the space for multilateral agreements and global cooperation seems evermore diminished.

Summary

Question 1. *The new push towards technological sovereignty: How does this new impetus towards technological sovereignty reframe science, technology and innovation policies at the local, regional, national and global levels? Has the political economy of innovation strategies changed?*

Professor Jakob Edler: I think it has fundamentally changed. If we think of science, technology and innovation as a continuum – even though we know that it is not a linear process, but for the sake of the argument – the more we move to the technological and innovation end of that continuum, of generating novelty, the more it has changed. I, however, see a dilemma or tension: on the one hand, there is a call for keeping international scientific cooperation as broad and as intensive as possible, on the other, countries must make sure they can access the kind of input they need to develop the technologies they need in the short-term. We have a debate on this dilemma everywhere, and people realized that if they go too far and start to insert a lot of distrust, also in terms of scientific collaboration, that is and will be bad for the global economy for many years to come. So, yes, it has fundamentally changed. The new fundamental question now is: what are the critical inputs and knowledge needed, and do we have enough access in the future? There are different ways of securing access, not only doing it yourself. This was not a question ten years ago; the only question asked ten years ago was "are we strong enough for technological competition?". It was not about access; it was about competitiveness. The questions may seem similar but are quite different.

To give an example: we have never thought of the danger of markets closing, and neither of global pandemics that would increase the demand for commodities like masks in an unprecedented way. But if you think about the international division of labor, along value chains, or even what happened at the Suez Channel, we now have shortages. And now look at the German construction sector, some of the supplies needed to build houses are globally sourced, and we don't have them. Because of the global division of labor that follows the liberal market idea of efficiency, we never thought it could break that quickly. The whole dynamics of globalization has dramatically shifted.

In Germany, I wouldn't say that being a slow follower was an acceptable alternative to being a cutting-edge innovator, but I know that the focus has now shifted somehow, in order to ensure that you can do it yourself even if it's at the expense of doing it a bit slower. But Germany will continue claiming that in key areas of its economic growth they need to stay at the leading edge. It is a new balance, and Germany has become a bit more modest in realizing how fragile its economic model is because of the dependency in many areas. If you then think of the key critical technologies of the future, Germany has lost many. We had these technologies but because of the imports we have lost the leading edge. In artificial intelligence (AI) and digital economies, we fall behind. Five years ago, it wouldn't have been a concern. But now if we cannot use these technologies, then of course we run into a problem.

Dr. Paulo Gala: The rise of China accelerated rich countries' awareness that they were losing technological sovereignty. Since the Europeans and Americans had always been on the frontier, they were less concerned about this sovereignty issue, until East Asia, especially China, but not only China, also Korea and Japan started to advance greatly. In my opinion, the Covid-19 pandemic was an event that substantially exacerbated their need for awareness, because at the end of the day, there are a lot of technological issues involved in the pandemic, such as, equipment for treatment - like respirators and breathing fans, or the N95 masks, for example. Many countries have begun to ban the export of such equipment, such as Taiwan. In a context of panic, we saw a huge vulnerability of production systems, and almost a war for survival, which greatly accelerated the awareness, especially of Europeans and Americans.

If we look back at the 1960s and especially the 1970s, when Japan took the US market for automobiles and then electronics by storm, we see a very different dynamic to the US dispute with China. At that time, Japan had no military capability, which made it much easier for the US to deter Japan than it is to deter China today. The Americans were able to somewhat reverse the situation just in the monetary sphere in the 1980s. However, today in relation to China, their position is quite different, as it is a geopolitical power, with military capability and ruled by a "communist" party. Furthermore, China has achieved cutting-edge technological advances; 5G is a symbolic example. Trump at one point realized that all tele-calling and high-speed Internet equipment would run on Chinese machines...

Dr. Adriano Proença: My background is the "world-system". It is not possible to understand the trajectory of a country in isolation, it is necessary to understand the world context. For me, Asia, for example, has always 'pulsed' along with Europe and the United States; it has been part of the world-system for a long time.

This new impetus, to which the question referred, brought back something that was on the fringes of the central axis of debate in the West, but was very much alive during the Cold War, and started to return in the years of the Obama administration. Apparently the 2008 crisis 'detonates' this process, because it occurs in parallel with the leap in Chinese technological and industrial ambition, explained by the 2006 Medium and Long-Term Plan, providing context for the establishment of the 2009 Obama Plan [*American Recovery and Reinvestment Act of 2009*]. This technological and industrial ambition emerges with force in China, with greater intensity than it expressed before, and this apparently 'wakes up' the debate in the US. Since then, there have been different demonstrations in the US Congress; and, for example, CFIUS blocking Huawei and ZTE Corporation in the country's market because of national security concerns. Obama, in turn, made a program to favor advanced manufacturing, and the American state governments rushed to win some preferred laboratories; there is a competition between the state governments to get a federal laboratory, along with the local industry. In other words, there was a discussion about regional vocation to justify the effort to attract investment in resources for innovation in specific sectors. The discussion about science, technology and innovation returns, mixed with the discussion about industrial policy. It starts to pick up speed in 2006-2008, perhaps as a mirror of an acknowledgment by the United States that China was turning the tables, and this ends up leading to mostly reactive speeches. The way in which DARPA started to be treated in the media in general, being highlighted as a positive case, suggests a change along these trends. Trump apparently was a hiatus in this process, but with the election of President Biden, more assertive policies are taken over, in line with the Obama administration. The Biden administration signals a new set of pressures coming from relevant actors, mainly from the industrial field. The state apparatus welcomes these pressures, "gives its opinion", and returns a more general orientation for the repositioning of the US, which Biden expresses when he wins the election and goes on to say that the US will "again lead the world".

An interesting small signal (but meaningful) to consider is that China 'warned' Eurasia that its game would necessarily pass through the Belt and Road Initiative – and its

offshoot, the Digital Silk Road – coupling a ST&I discussion with infrastructure investments. Another sign is the growing reference by neoclassical economists to the discussion of innovation, for example referring to the book by [Phillipe] Aghion et al., recalling the ideas of [Joseph] Schumpeter.

In short, I would say that this 'new push' started around the turn of 2006-2008, and now, even more than the pandemic factor, is the China factor the most important to this new political economy framing or an explicit resurgence of the debate about innovation policies. China's option to intensely seize the opportunity of a new wave of technological innovations causes other countries to start, in a way, to incorporate aspects of the concept of *innovation driven development*. China developed very competitive companies, such as digital super players, very impressive; in space and satellite there are great achievements as well. That is, there are technological achievements for China; by business players, by the military component (although not very transparent to non-specialists like me), on the issue of cyberwar, etc. China's options to focus on S&T and innovation and make a more explicit and substantive industrial policy from 2006, picking up speed throughout the XII and XIII Five-Year Plans, provoked and is provoking reactions in the West, as it is seeing Chinese companies, for for example, commanding the production of patents in some sectors, and several concrete results suggesting that the 'model' is working. In other words, in my view it is the rise of China, and Asia in general, that creates this impetus for debate and actions aimed at "technological sovereignty".

> **Question 2.** *Covid-19, global priorities and prospects for collaboration: What lessons can we take from the COVID-19 pandemic for the alignment of local, national, regional and global priorities and for the strategies to address them? Why do national governments fail to cooperate in addressing common threats? Have the prospects for collaboration, of alignment of priorities, also changed?*

Professor Edler: I think that it has changed, too. Everybody now tells how collaboration is important for technology and to develop the science and prevent a next catastrophe. However, when reality comes to fruition, as you see with the UK and German experiences, the immediate response is to first choose security for ourselves. "Ourselves" is the nation state; the reference frame for solidarity in society seems to be the nation state – if we like it or not; I am not making a normative statement here. And Covid-19 has shown it: in the first four to six weeks, I couldn't believe what countries – and especially my own country, Germany – have done in terms of shutting down borders, preventing certain materials going to neighboring countries like France, taking moves that were damaging the European spirit! My main point is that what really counts is the nation state, and this is not only true for Covid-19, but also for industrial strategy. The first draft of the industrial strategy from the German government, from two years ago and later heavily revised and improved, seemed like it was drafted in the 1970's, proposing for instance the creation of national technology champions, with European aspects appearing just as an afterthought… So, things have already shifted before Covid-19.

Dr. Gala: In hindsight, one can see how during the pandemic developed countries panicked over the bottlenecks. The first bottleneck was the mask, then the ventilators, and finally the vaccines. When it got to this point, the issue was evident, because the vaccines were only developed due to public investment. In reality, the development of the mRNA vaccines was due to DARPA funding a project in the early 2000s, looking for answers to biological weapons... The mRNA vaccine came out fundamentally because of that investment. European production was also concerning because its input chain was botched, and they had lost bottling capacity. The logistic chain of inputs and production was disorganized. This shows that technology was essential for fighting the pandemic, and it brought back awareness on technological sovereignty.

The episode of the potential "breaking" of vaccine patents is interesting. It is important to point out the paradox, because it was American public money that created the vaccine that then fell into private companies' lap. So it's a totally improper patent, even if it makes sense in the US - because it's taxpayer money that went into the private sector - but it is important to say that it's a patent created from public money. Anyway, breaking the patent helps, but it is necessary to have the production capacity to manufacture the vaccine, because it is not something trivial. Brazil has the capacity, at Fiocruz and Butantan, which makes breaking the patents beneficial to Brazil, but at the end of the day, this break only helps middle income countries that have already developed capacity, in the Brazilian case, from public investment. Our capacity to make vaccines comes from public money. For poor countries, patent breaking doesn't mean a thing.

Dr. Proença: Certainly, digital diffusion has accelerated because of the Covid-19 pandemic, and the centrality of public health has become undisputed. However, I don't believe there will be radical changes, and I do not see Covid-19 producing a new 'global alignment'. I believe the real driver might be the issue of climate change, which is a powerful driver and has helped make the US Democratic Party explicit as the bearer of a proposal for a "healthier" capitalism. The question mentions a "failure to cooperate," and I point out that this assumes that there was cooperation before, but I do not see it as a failure because I do not think they "tried and failed," but that, in reality, they did not even try! The driver that can promote this need for collaboration will be climate change, which is fundamental for our time, because the effects on agriculture are striking, among other important impacts. And they can also disrupt Brazil's and other countries' insertion in the world. Regarding the pandemic, the promoters of industrial policies, having faced restrictions and obstacles more than 20 years ago, take advantage of the Covid-19 pandemic to convey ideas in favor of this positioning. The pandemic is an opportunity to reinforce the reframing of the industrial policy discussion mediatically. However, in my understanding, this discussion dated back before the pandemic.

Question 3. Technological sovereignty, the SDG ("grand challenges") agenda and multilateral agreements: What are the risks of the push towards technological sovereignty to the global SDG agenda? What are the prospects for multilateral agreements in the areas of the digital economy (issues of cyber security, online privacy and economic power of big tech) and of the environment? Are there prospects for a global "mission-oriented" policy to address grand societal challenges or will we see national mission-oriented policies to achieve technological sovereignty?

Professor Edler: In the environmental area, there has been a very encouraging development since the Lund Declaration[1] in 2009. In many countries, the SDGs are not only labels but started to shape the discourse and open the eyes of people and decision-makers to the global nature of all these sustainability issues. But, when it comes to regulation that relates to areas deemed critical for economic development, national autonomy and securing people's lifestyle, I think these conversations and agreements at the global level will become more and more problematic. There will be a mismatch between the recognition that we need to regulate globally in certain areas, on the one hand, and this impetus towards technological sovereignty and competition (between the US, China and maybe Europe), on the other. It's all intricate. I think it is a big issue specially because these regulatory frameworks are not only regulating economic behavior but also the way everyone lives together and uses technology. Ethical, environmental and social considerations are very different, not only between Europe and China, but I would say between Europe and the US as well. I think it is a truly incredible recognition that we have to do more together, but at the same time it has been confronted with this geopolitical and protectionist discourse that accelerated due Covid-19.

And there is an important issue, which is not too strong in the German debate yet, but it might come back stronger soon, which is: if we accept the Sustainable Development Goals (SDGs), and see the climate problems as truly global, then we must cooperate on a global scale. But the question is, to come to solutions, we have to tell ourselves (the

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[1] In 2009, 350 researchers, research funders, business executives and politicians gathered for two days to discuss the future development of European research. Participants agreed on a document – the Lund Declaration – that called upon European Member States and European Institutions to prioritize their research on the Grand Challenges of our times, such as climate or demographic change, and to move beyond rigid disciplinary approaches, aligning strategies and instruments.

voters) that we must dramatically change our lifestyles and shift our priorities. We cannot do the same as in the 1960's when more was better. So the question that must be raised, from a neorealist perspective is: can international and supranational organizations, do they have the authority to demand these kinds of burdens and lifestyle changes from citizens? Or do we need a stronger legitimacy for these kinds of drastic changes through the nation state? This is not a question I would pose one year ago, but it is something I must consider right now. Because whenever Europe comes up with something that limits the freedom of people to express their lifestyle, the reactions are very strong – "I don't want an European bureaucrat to tell me how to live my life!". But if it comes from the national government, elected, and there is a parliamentary process, there is a different kind of legitimacy for these measures, which are absolutely critical. It does not mean we do not need global collaboration – my view is not a neorealist/neoconservative view, but this question of authority is something that we have to take seriously. Covid-19 has shown that the national level seems to be the level of solidarity for big decisions, and if that is true, maybe we need to promote international cooperation but much more through the national states rather than global organizations. That is not what I would like to see, I'd like to see liberal democracies able to integrate, but the problem has somehow shifted to another level, and Covid-19 shows that the state remains strong. But we need more international collaboration through nation states. If you had asked me two years ago, I would have said that we need much more autonomy and competence from the International Energy Agency, the World Health Organization and all the UN agencies, but I've lost faith in that.

A mission, which aims to create technological sovereignty, I would not indulge. A mission is something very different and is about critically solving problems. So, the question is: If we want to work towards those missions, how does this conflict with the idea that countries think about technological sovereignty? Being able to access what technology we need is important both for economic and welfare, but also important for changing your sociotechnical systems in a way you want. Let's say you have mission-oriented policies for transforming energy or mobility systems. To do all kinds of systemic changes in a country, you need access to critical technologies that you don't have. Even Germany would be slower if we could only rely on what we can do ourselves. So today there's a need to think about access to critical technologies not only for economic welfare but also for the kind of missions you want to achieve. Second thing, some of these missions make much more sense if we pull off our resources and do it together. And the only frame to do it together is, of course, frame technological sovereignty in the European dimensions

and define missions in the European level. I don't see any kind of missions at the level of international organizations, maybe little missions in the IEA or WHO. So for us, as Europeans, it is absolutely critical that we define technological sovereignty and missions at the European level. Because then it generates sufficient trust and openness in terms of the internal markets. In Europe, these two things could nicely work together

Dr. Gala: The field of regulation is also interesting from the point of view of economic development. There are subjective barriers to trade; technical norms and standards that are disguised ways of putting up barriers. China has made its use very clear, by greatly limiting the entry of other countries into the Chinese technology market, which is extremely protectionist, and using standards set by the government. At the end of the day, there is a war for standards, because it's not about finding out which standard is best, it's about finding out which standard is best for each country, and each country will try to impose its own standards. It is a disguised and subjective commercial dispute. In the world of digital platforms, the technological standard of systems and software, gives you great monopoly power, because if you have the platform, you have power over all the plug-ins that attach to it. Another example is the 5G communications network and the technological standards that have been used in it: if you can impose your standard, it gives you enormous monopoly power. And there will be a huge "battle" between the powers. How this will unfold on the level of multilateral agreements is yet unknown.

Dr. Proença: I have the impression that the climate change discussion can precipitate some type of collaboration and be a good driver for us not to get into a Cold War rhetoric. I believe that climate change has more power than Covid-19 in creating the conditions for a broad global cooperation effort. In this sphere, the US government would have a prominent role as a political leader, but from the institutional leadership standpoint, both in digital and climate, I would say that the West and its allies look to Europe as a source of institutional references (of policies and standards). China also follows the institutional discussions of the developed world. I believe there can be political leadership in Biden to put together an agreement with Asia – the United States potentially have the capacity for coordination; however, the content of the regulation and the references, I believe will come from the European Union, which seems to be at the forefront of this debate.

On the other hand, there is a geopolitical dimension that was perhaps less noted a few years ago but is now prominent because of the way China has positioned itself. Both the *Belt and Road Initiative* and the *Digital Silk Road* are visions of opportunities to integrate

Eurasia. Global value chains are organized according to the vocations and economic spaces that countries can occupy. There are many pitfalls, but the main one is for a country to remain in a place it already occuppies because it is self-satisfied. The idea that China was going to settle for a role from the "Red Queen's race"[2] era – a creative fast follower – does not hold anymore. It is going to try to move to the frontier, so, in a sense its industrial and technology policies are about innovating and moving the frontier.

China holds the idea that a country should be sovereign over its own Internet, it insists on that and proposes that countries embark on this perspective with it when it discusses the *Digital Silk Road*. This is a tricky part of the process, because how will the West - which advocates open Internet - come to an agreement with China? Would it agree to a multilateral accord? I think that passing a "GDPR" [General Data Protection Regulation], like the Brazilian or European, in China will be difficult, because they have a more collectivist and state-centered perception, while that of the West is more centered on the individual and autonomy. This is beyond my analytical capacity, it is a complex issue with a capital C, which demands, for example, knowledge in comparative History and Philosophy that I do not have. I personally believe that Enlightenment values are superior and better for humanity, but I recognize that this is a typically Western 'ideological' position.

The SDGs, for example, were collectively built through debate, and have the legitimacy of the UN, so it is reasonable to take them as a universal discourse. But it is different in cybersecurity. I believe that China would like to be integrated in the global sphere – as, in principle, it is in health - but I don't see the country accepting an open Internet. To integrate by renouncing the ability to "protect" China, as the Chinese Communist Party understands the issue..., I don't believe it. If American bigtech makes a big deal with Chinese bigtech, despite the latter being much closer to the government than it was before, perhaps they can come to operate in concert. In terms of self-interest, I think there is a possibility that they will put pressure on their allied nation states to make some sort of deal, but I don't see the CCP accepting that sort of thing. And the Americans also have their policy, less explicit, but obviously they also maintain and develop their security apparatus, and they try to give shape to the world, as in the case of pressuring Huawei.

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[2] Reference to the book Run of the Red Queen: Government, Innovation, Globalization, and Economic Growth in China (Yale, 2011), by Dan Breznitz and Michael Murphree, which posits the thesis that China's technological strategy was to be a fast-follower of foreign technological developments but not a frontier innovator.

I think in health and climate change we can achieve common benchmarks, but in cybersecurity, I find it very difficult.

Question 4. *Technological sovereignty and developing countries: We could think about two different types of techno-industrial sovereignty or goals to address the global supply chain crisis: one is to build a resilient industrial value chain and the other is to have technological sovereignty. Are these alternative solutions to the same issue? And can any country choose which alternative to choose? What are the implications for developing countries (Brazil, in particular) of this new push towards technological sovereignty? How should developing countries position themselves in this scenario of geopolitical tensions over technologies and industries, as exemplified by the worsening China-US relations?*

Professor Edler: In our definition of technological sovereignty, we don't say that's about "being able to do it yourself" but ensure we have access to the technologies. The question is then: "can we make our international well-established value chains resilient also against the geopolitical fractions that we will see in the future?". That's the main point. You can model all kinds of resilience into these value chains, but the US-China dispute might mean that whole value chains in the future might need to decide to be in the US or in the China camp. Now, it is not only about the economy, we have normative questions now too: it is also, about what we want to do with technologies, what will be allowed to be done. I agree with the premise of the question, "let's try to define technological sovereignty, so we can make sure that in the future we'll be resiliency in value chains". That should be the premise.

However, geopolitics seems to go in the other direction, and how much can we rely on what we now think is a resilient value chain? I mean, six years ago, before Brexit and Trump, we would not have these discussions, it would be a totally different discussion. The trust of the Germans, and I would say the Europeans, in the US to be a reliable partner in all these value chains has diminished. But, of course, there's so much mutual interest in these interdependent value chains that I don't see sudden disruptions across all technologies. Yet, a resilient global value chain today may not be one in five years for geopolitical reasons that we might not be able to foresee. So, people are nervous about this, there's a lot of slack and redundancies, and that's why they are trying to bring it to Europe. Let's take Brazil as an example. I am sure there are a lot of value chains where Brazil plays a critical role and you'll have to decide at some point on which camp you will stay. To stay neutral is only possible if you stay in low tech, in commodities.

In my view, developing countries and countries in the periphery of Europe have to be very conscious and explicit about their role in these global value chains, and establish themselves as reliable partners in them. In some areas, unfortunately, they will have to make decisions about which kind or whose value chain they want to be integrated into and which kind of openness for their economy they want. And the US will put pressure on Latin America, I'm absolutely sure about that. In terms of producing commodities, or, in the next pandemic, making sure it has access to simple products like masks, Brazil can do it, Lithuania can do it, and every developing country might do it. But in terms of developing technologies for the future, those countries will have to play the technological sovereignty game.

Dr. Gala: The first point in question is that in this scenario of Chinese-American conflict the bargaining power of countries like Brazil increases a lot. When there is tension between giants, it is possible to bargain with one or the other, through an "auction" logic: who gives more? The USA or China? This scenario opens up the opportunity to negotiate advantages. Argentina has used this space, for example, thinking more strategically in this multipolar, or perhaps bipolar, world. This happens at the level of action. In terms of narratives, the discourse has changed greatly. Industrial policies are in vogue at the IMF, which is something unexpected from a traditionally neoliberal body; there is a very important shift in narrative for countries to do the once hidden military developmentalism. Because the Chinese have put the US in a check position from a technological sovereignty standpoint, Westerners have torn up the veil and had to make industrial policy plans to seek to maintain the technological frontier. China made a GPS system of its own, putting 35 satellites in orbit around the Earth with several rockets, and landed a probe on Mars and the moon, i.e., using a historical parallel, it is a *Sputnik* moment. The new space dispute has brought the issue of industrial policy into the open, as China's clarity and intensity has pushed Western countries to mobilize and take up the industrial policy narrative. It is worth remembering that it is an unexpected narrative, since in the 1990s, for example, in the field of economics it was commonly said that industrial policies were responsible for maintaining Latin America underdeveloped. Now the whole world is investing in industrial policies. This opens a space for intellectual narratives in Brazil.

However there are two issues: the first is the intellectual/scientific issue and the other is the power issue. We know that, at the end of the day, both the World Bank and the IMF and the WTO are ruled by power, by who is in charge there. The WTO is less concerned

with discussing free trade, than with maintaining the status quo because the rich countries are the bosses there. Look how skillful China has been in the WTO issue, using it as it fits it best. I am very pessimistic about changes in these power structures, because they are there to maintain the status quo and not to promote structural transformation or facilitate the technological advancement of emerging and poor countries, and it will become increasingly embarrassing for them to criticize neoliberalism. It is clear that they stand for power ideas and not technical/scientific ones. But that said it is a lot of power and a lot of money....

What can be done, through strategic thinking, is to use the margins and gaps. To increase the complexity of our [Brazilian] economy and insert ourselves in this margin, I like to use Hausmann and Hidalgo's [3]idea of adjacent comparative advantage, that is, something that is close to your comparative advantage. Because it is clear that we are not going to be able to dominate technologies on which we do not have the know-how. But there are frontiers such as: oil, gas, petroleum, defense industry, health, and agribusiness, among others, where we could advance a lot. Bioeconomy for sure, as well as renewable energy, since we have developed capabilities, so it is a very promising frontier, but we need a government that has the vision of a development mission to advance these adjacent comparative advantages.

Dr. Proença: Developing countries are not equal, but the common fact is that in the face of the US-China tension everyone will have to take a stand. I think Brazil has a particularity. We must position ourselves in a multipolar environment, but we have a tradition of doing that; since the Baron of Rio Branco, at least, we have always talked to the various powerful actors. We always talk to the US, to Europe, to the 'third world'; now China is a power and our main trading partner, we must establish our own identity and relationship in this context. This is no different from the Singapore prime minister's speech, for example. There will be a tendency in the world to lean one way or the other, but we will remain multilateralist; conversations and negotiations with either side should not be renounced. As part of South America, we have a relationship with Europe that is unique, as it is very strong, which sees itself strongly linked to Europe, at least culturally.

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[3] Ricardo Hausmann and César Hidalgo are pioneers in developing the economic complexity approach. See: Hidalgo, C. A., & Hausmann, R. (2009). The building blocks of economic complexity. Proceedings of the National Academy of Sciences of the United States of America, 106(26), 10570–10575. https://doi.org/10.1073/pnas.0900943106

An example question is how are we going to buy the 5G from Huawei – which is cheaper and more robust – without 'offending' the Americans? It is in our interest to buy from them. But the US continues to pressure... Anyway, we will have to find a way to escape this trap, as Brazil is interested in maintaining a good relationship with China – illustrated by our participation in the NDB [New Development Bank, development bank of the BRICS], for example.

Another important point is that, assuming the results of the research by professors Afonso and Maria Tereza Fleury, there will be an emptying of noble functions of foreign multinationals in Brazilian territory if they feel that there is not much to gain, because digitalization enables forms of management in which you don't need to leave high-level decisions at local headquarters. They will only maintain high-level functions here if: (1) they are developing specific technologies and products for a relevant market; and (2) if they are going to develop specific expansion strategies. It is in Brazil's interest to wake up to the fact that we are in South America, and that we should give a real rethink of what the region means to Brazil, considering the market, integration, consumption patterns that are not so different, for example. I have the impression that a greater presence in South America would enable Brazil to have a greater economic and social space as a reference, with several geopolitical gains, and would attract high-level functions from foreign multinationals, while Brazilian multinationals could develop their vocations in the region, while continuing to export to other regions. Because, apparently, South America is not the object of attention of many actors in the world. In this sense, I think we need to reflect on our role in regional relations.

As for the sectors, Brazil could find paths from where it already has strength; we could expand our agro-industrial chain beyond traditional exports. We could develop agroecology, which would not need to start on a large scale, as there is a differentiated and more affluent market for agroecology; we have many opportunities in the so-called 'bioeconomy'; herbal medicines, for example. In mining and oil and gas we have promising opportunities as well, as well as in sustainable energy. In the digital world, relevant national companies have grown and can expand. The point is not an insulated 'sovereignty'; we have to assert ourselves as an autonomous country, with our own agenda, and give positive meaning to the existence and evolution of Brazilian capitalism based on the strengths it already has, expanding this socioeconomic space and providing innovations within the scope of what we already have and in its borders, in the context of the urgent social inclusion that we need to promote. This suggests that we

need our own industrial, technological, competitiveness and development policies, in line with what the Chinese, and indeed all relevant countries, are currently doing.
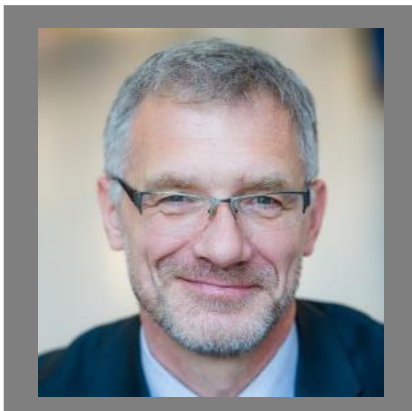
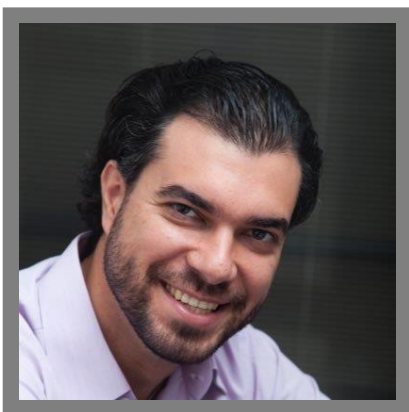**Participants**

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