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# Catching up and Falling behind: An Appraisal of Brazilian Industrial Policy in the Twenty-First Century

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Abstract

Amidst analyses of industrial policy's renaissance in Latin America, Brazil is often hailed as the paragon of this movement. The mix of old and new institutions and instruments would constitute a unique effort in promoting industrial development in the post-neoliberal period. However, this experience has been followed by middling results of industrial performance. Reviewing an emerging literature about the institutionalization and results of the Brazilian industrial policy, we argue that important aspects of path-dependency have been ignored. Organizational and ideational resistance have led to a much more traditional and conservative industrial policy than would be expected. Grounded historical analysis about intra-government conflicts, combined with studies about policy and sectoral developments, could give us elements to better assess the failures and achievements of the Brazilian case. *Keywords:* industrial policy, Brazil, path dependency, innovation, institutions.

Resumen: Avances y retrocesos: Una evaluación de la política industrial brasileña en el siglo XXI

A la luz de diversos análisis sobre el renacimiento de la política industrial en América Latina, Brasil es frecuentemente alabado como el país arquetipo de la mencionada coyuntura. La combinación de instituciones e instrumentos antiguos y modernos constituiría un singular esfuerzo para promover el desarrollo industrial en el periodo post-neoliberal. Sin embargo, la consecución de dicha experiencia fueron mediocres resultados de actividad industrial. Habiendo efectuado un examen de reciente literatura sobre la institucionalización y los resultados de la política industrial brasileña, sostenemos que, en dicho material, han sido ignorados importantes aspectos de la dependencia de la trayectoria (path-dependency). Resistencia organizativa y de formación de ideas han conducido a la implementación de una política industrial mucho más tradicional y conservadora de lo que se hubiera esperado. Un profundo

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análisis histórico acerca de conflictos intergubernamentales, combinado con estudios sobre política y evoluciones sectoriales pueden ofrecernos instrumentos para evaluar más eficazmente los fallos y los logros del caso brasileño. *Palabras clave:* política industrial, Brasil, dependencia de la trayectoria (path dependency), innovación, instituciones.

In the introduction to a recent survey of current debates about industrial policy, Stiglitz and Lin (2013) state that modern industrial policy is ‘the belief that government can play a constructive role in shaping the economy – indeed, there is no choice but for it to do so’ (p. xiii). This statement reflects the renaissance of industrial policy in academic and governmental debates around the globe following the strong criticism promoted by the neoliberal wave of the 1980s. Even in a region like Latin America – where the dominant import-substitution industrialization (ISI) regime was heavily associated with all sorts of rent-seeking and inefficiencies – industrial policy initiatives have blossomed during the last fifteen years.

As many authors argue, however, these recent Latin American initiatives differ substantially from the ones adopted during the heyday of the ISI model (Schrank & Kurtz, 2005; Peres, 2011). In broad terms, we can summarize these differences with four main points. First, countries have replaced an inward-oriented economic development model with a more outward-facing perspective. Recent policies abandoned the focus on supplying domestic markets, and are now oriented toward exploring existing comparative advantages that can enhance a country’s export competence. Second, since there are fewer opportunities for using instruments such as import tariffs and quotas in the current international trade regime, most incentives and subsidies have a clear fiscal nature. This means that industrial policy now competes directly with other relevant policy domains (e.g., housing, health, and education) for resources in national budgets and requires stronger political support. Third, this current wave of industrial policy explicitly promotes innovation and R&D capacity as key instruments for upgrading national production regimes. Lastly, as good coordination between government and business has been increasingly seen as a necessary condition for success, most Latin American countries have established some type of public-private alliance in the form of councils or forums to support the formulation and monitoring of industrial policy initiatives (Schneider, 2013; Devlin, 2014).

In scholarship on this topic, Brazil emerges as the paragon of this Latin American rejuvenation of industrial policy. A series of studies claims that Brazil has incorporated all the above-mentioned points in its recent economic trajectory, while also renewing traditional developmental institutions and instruments in the promotion of industrial growth (Ban, 2013; Mazzucato, 2013; Doctor, 2015). However, despite all the praise for Brazil giving industrial policy another chance, it is difficult to say for certain that the Brazilian effort has been successful. During the last several decades, the country’s industrial production has declined dramatically. Between 1985 and 2014, industrial production as a share of Brazil's GDP halved from 21.6 per cent to a mere 10.4 per cent (FIESP, 2015). This downward trend becomes even more dramatic when we observe Brazil's incomplete integration into global markets. Looking at Brazil's participation in global trade, we see that the country has experienced a declining share in global exports of industrialized products in recent years. While the rise of China and currency issues are often presented as explanations for this trend, Brazil has not managed to improve the profile of its industrial exports. Looking only at exported industrialized products, the country has experienced a reduction in its share of exported products with medium- and high-technology content (IEDI, 2015). Considering these poor results, the Brazilian government has had to deal with growing criticism of the high fiscal costs of subsidized credit and tax incentives awarded to different sectors over the last few years. As de-industrialization seems to have occurred in spite of government efforts, can Brazil really be considered a good example of the renaissance of industrial policy? Or has Brazil revived industrial policy only to see it disappear again under the weight of its apparent ineffectiveness?

## Path dependency in Brazilian industrial policy-making

The mainstream narrative about Brazil's recent industrial policy experience establishes a clear periodization. After almost two decades of neglecting industrial policy, the first term of President Lula Inácio da Silva (2003-2006) represented a turning point. More specifically, the launch of the Industrial, Technology, and Foreign Policy (PITCE – Política Industrial, Tecnológicae de Comércio Exterior) document in 2004, followed by the creation of the National Council of Industrial Development (CNDI – Conselho Nacional de Desenvolvimento Industrial) and the Brazilian Agency for Industrial Development (ABDI – Agência Brasileira de Desenvolvimento Industrial), have been hailed as landmarks of the rebirth of industrial policy (Coutinho, et al., 2012; Kupfer, Ferraz & Marques, 2013).

Recent studies, however, have toned down this slightly triumphalist perspective and emphasized various points of continuity between the Brazilian industrial policy inaugurated by the first Lula government and previous regimes. Hochstetler and Montero (2013), for instance, argue that Brazil's recent industrial policy should be understood more as the scaling-up of a gradual state-led strategy aiming to align the country within a more globalized economy than as a clean restart. Through a comparative analysis of policy documents and programmes since Brazil's re-democratization in 1985, the authors show that the central idea of the state playing a strategic role in promoting industrial development and upgrades never disappeared, even if strategies of implementation sometimes shifted. In that sense, they suggest that the continuity of a 'developmental' bureaucracy in traditional institutions such as the National Bank for Economic and Social Development (BNDES – Banco Nacional de

Desenvolvimento Econômico e Social) and the Funding Authority for Studies and Projects (FINEP – Financiadora de Estudos e Projetos), Brazil's innovation agency, played a key role in preserving this legacy.

While representing an important asset for the continuity of industrial development strategies at the national level, the bureaucracy also plays an important role in vetoing broader institutional changes. Recent studies of the CNDI and the ABDI show intense intra-bureaucratic conflicts between these two newcomers and BNDES regarding who is in charge of Brazil's industrial policy. During his first term, Lula established the CNDI as a deliberative, tripartite forum with representatives government, business, and labour unions, following the PITCE's proposal for addressing the fragmentation of industrial policy initiatives and the lack of formal public-private arenas for discussing these topics. In addition, the ABDI was created to coordinate the CNDI's working groups, to support the council with analysis, and to implement, as well as to evaluate, the PITCE. As Mirra and Salerno (2015, p. 124) put it, the ABDI should work as the *gatekeeper* of industrial policy – the same way that a central bank conducts monetary policy.

De Toni (2015a) shows that this new arrangement worked fairly well for a brief period between 2004 and 2007. Through a process-tracing analysis of Brazil's legal reforms aimed to increase private sector R&D activities, the author emphasizes how the CNDI was an important arena for consensus-building between the government and the private sector, and how the ABDI emerged as an important coordinator of the CNDI's agenda. Moreover, De Toni argues that the CNDI contributed to a seemingly more transparent process in establishing industrial policy, as preferences from different sectors were made public and registered in the proceedings of the meetings. However, the existence of traditional bureaucracies already dealing with important aspects of Brazil's industrial policy generated many intra-governmental conflicts and turf wars that gradually weakened the CNDI – and consequently the ABDI as well.[1] A clear sign of this dynamic is the decline of CNDI activity in recent years. While the council had fourteen meetings from 2005 to 2007, it had only four meetings from 2008 to 2015.

While De Toni (2015a) only briefly discusses the CNDI and ABDI's decline, he offers two possible explanations for it. First, the 2008 financial crisis meant that BNDES moved to the forefront of Brazil's industrial policy implementation. Responding to the closing down of international markets, and benefiting from Brazil's good fiscal standing, the BNDES tripled its loans from R$51 billion in 2006 to R$168 billion in 2010, becoming one of the largest development banks in the world. Naturally, administering such enormous sums granted the bank an influential role in directing the industrial policy. Second, Lula's chief of staff and presidential successor, Dilma Rousseff (2010-), promoted an increasing centralization of all economic decisions, including industrial policy, and gradually shut down all dialogue with the private sector. Under these circumstances, the CNDI became more of an arena for business and labour leaders to learn about the government's plans than for genuine deliberation. Consequently, the result of a dormant CNDI has been an inconsequential ABDI.[2]

The ill-fated cases of the CNDI and ABDI demonstrate the challenges of breaking institutional trajectories and highlight important issues about development. While Lula's first presidential term introduced interesting institutional novelties for formulating and implementing industrial policy, we see in hindsight how fragile this arrangement actually was. To a certain extent, this dynamic reflects the already known pattern of state-business relations in Brazil, where the state always had a top-down approach to business and labour, and industrial policy initiatives relied strongly on the favours of the presidency (Schneider, 2004). The novelty of recent developments, however, might be the process of *capture by the bureaucracy* of industrial policy, particularly by the BNDES. Drawing on the framework of 'palace wars' used by Dezalay and Garth (2002), the story of the internal ideological conflicts during Brazil's 'post-neoliberal' period – and BNDES's role in them – remains to be told.

Several scholars have identified the existence of a highly capable institution like BNDES as something of a double-edged sword. For example, Hochstetler and Montero (2013) showed that BNDES's more than 2,100 loans from 2002 to 2011 favoured a few big companies, with ten companies receiving 21.3 per cent of the total loan amount. Musacchio and Lazzarini (2014) find similar results looking at BNDES's loans from 2002 to 2009 to public companies registered on the Brazilian stock market. While loans were presented to a relatively broad range of companies in 2004 (with electricity companies representing the largest borrowers), by 2009 Petrobrás – the state-controlled oil company – received almost 40 per cent of the bank's loans.

A frequent criticism in these studies is that Brazilian industrial policy subsidizes consolidated companies that are solid enough to borrow funds in regular financial markets rather than supporting new and innovative sectors. While the BNDES itself partially justifies these results as an explicit policy of consolidation and internationalization of 'national champions' dictated by the government, Musacchio and Lazzarini (2014) propose an interesting alternative explanation based on BNDES's organizational characteristics. They argue that BNDES is a very conservative and technical financial institution, which tends to support only well-designed and profitable projects from companies that are able to provide strong financial guarantees. In this sense, BNDES creates a bias towards a conservative industrial policy, as it was not designed to assume the risks inherent to supporting innovative activities. This same conservatism links the bank to politically connected firms via indirect means. As Musacchio and Lazzarini show, companies with large public contracts can usually present better financial guarantees than other companies, which lead to funding from the bank on advantageous terms. Controversially, there is a strong correlation between companies with public contracts and official (and unofficial) campaign contributions to political parties.

The new emphasis on financing large national companies' survival following the Global Financial Crisis also signals a clear shift in Brazil's industrial policy priorities. The previous emphasis on international competitiveness and exports was replaced by explicit efforts to sustain (and protect) domestic demand. This logic is especially visible in the oil and gas sector, where Petrobrás' high levels of investment after the discovery of huge oil reserves off the Brazilian coast in 2007 led to the more stringent rules regarding local content requirements adopted during Lula's first presidential term. This 'oil developmentalism' had the goal of establishing a vibrant chain of suppliers in the country – particularly a shipyard industry – based on Petrobrás' long-term demand for equipment and services (Schutte, 2013). Consequently, the company's business plan for the 2010-2014 period estimated US$30 billion in annual purchases from domestic suppliers. Recently, this strategy appears to have crumbled. In addition to the Petrobrás' corruption scandal involving high-ranking politicians and prominent businessmen, the consistent drop in oil prices has forced drastic reductions in the company's demand for equipment and services. As a result, many suppliers that were heavily dependent on Petrobrás have declared bankruptcy.

To be fair, BNDES has often used its equities arm (BNDESPAR) as an instrument to become a minority shareholder in a more diversified set of companies with somewhat better results.[3] BNDES's participation as a minority shareholder seems to improve companies' performance and capital expenditure, especially for stand-alone firms (Musachio & Lazzarini, 2014, p. 215). However, once again, BNDES has invested in more consolidated firms in order to minimize risk.

Examining specific sectors, BNDES seems to have succeeded in supporting the consolidation of new activities, such as the pharmaceutical and wind turbine industries (Shadlen & Fonseca, 2013; Hochstetler & Kostka, 2015). In both sectors, the 'nurturing' strategy of combining a stable public demand (i.e., drugs and wind energy) with market-based incentives for private sector (domestic and foreign) producers facilitated the establishment of a variety of new companies. In the case of pharmaceuticals, the huge demand from the state-run national health system was a convincing carrot for producers. In the case of wind, attractive BNDES subsidies ensured that suppliers brought production to Brazil to serve the growing market. However, we still have many unanswered questions. The most pressing issue is the lack of systematic comparisons between the different cases of success and failure, and explanations of what the dominant mechanisms are in each case. Moreover, in practical terms, this arrangement still has to prove that it can deliver the international competitiveness these sectors currently lack.

Looking at the failures and successes of this institutional system, however, we still see a model of financing industrial development that strongly favours the business status quo and politically selected sectors. As Rodrik (2004) proposes, the most important goal of an effective industrial policy in the twenty-first century is for government to promote the private sector's 'self-discovery'. In other words, the state should focus its resources toward stimulating the private sector to make new products and services in new ways. Brazil has taken some steps in this direction in recent years, but this process still needs to be properly analysed.

## The weak link of innovation

De Toni (2015b) presents some preliminary evidence about how Brazil has been institutionalizing innovation in its industrial policy. He argues that the CNDI was an important arena for the advancement of three laws designed to increase the private sector's R&D activities: the Innovation Law (*Lei da Inovação*), the Good Law (*Lei do bem*), and the restructuring of existing sectoral funds. To illustrate the efficacy of this new legal framework, he cites the subsequent increase in innovation grants FINEP awarded to the private sector.

However, there are many limitations in his analysis. First, his emphasis on the new policies of the Lula government overlooks important continuities and legacies. For instance, he ignores the fact that the Innovation Law framework had been debated during Henrique Cardoso's presidency, and that opposition parties – led by Lula and his Workers' Party (PT) – systematically blocked its approval in Congress.[4] Moreover, there was already a consensus within Cardoso's government about the importance of subsidizing companies' innovation efforts. Cardoso's government created sectoral funds managed by regulatory agencies whose purpose was to finance R&D activities. One strength of this model was that fees and fines charged to the private sector would finance it.

A criticism of Cardoso's model was its sectoral focus and the lack of broader institutional arrangements to fund innovation. Surprisingly, however, De Toni (2015b) ignores this debate and attributes the abandonment of Cardoso's model and the deployment of these instruments to 'the strength of the new ideas of the Lula government' (109). An alternative interpretation that refines this perspective is presented by Carlotto (2013), who looks at the *politics* of innovation policy in Brazil. For Carlotto, the internal conflicts within the Brazilian scientific community and the relationship this community has established with different governments since the country's re-democratization have been the most important forces driving innovation debates in Brazil. The scientific community, more so than the business sector, has been an important participant in the discussion about models of funding and commercialization of R&D and innovation. Nonetheless, the scientific community's role in this important industrial policy debate is still far from understood.

While the story about innovation debates remains to be told, the alleged success of this aspect of Brazil's industrial policy is questionable. PT's opposition to the Innovation Law delayed Brazil's policies by almost a decade, as the first government spending on corporate innovation took place only in 2007. In addition, so far, the results of Brazil's innovation policies have been meagre.

The number of researchers in companies, after peaking at about 50,000 in 2005, had declined almost 20 per cent in 2010 – becoming even smaller than they were in 2000. Due to fiscal reasons, the Treasury has also repeatedly blocked sectoral funds. In terms of patent filings, although the overall number in Brazil increased from about 21,000 (for 2001-2004) to 27,000 (for 2007-2011), the patents filed by Brazilian companies have remained stagnant since 2004. The clear message from these numbers is that foreign companies have increased their role in innovation in the country.

Furthermore, when we look at the volume of resources allocated to innovation, despite general increases in nominal amounts, it is clear that all spending declined in relative importance when compared to the growth of BNDES's budget in recent years (Table 1). The total national expenditures in R&D have presented a declining trend in proportion to the volume of BNDES loans, arguably the country's main industrial policy instrument in the period. Moreover, with exception of loans from FINEP, all the financial instruments created to promote innovation showed the same decreasing relative importance. These numbers tend to corroborate our earlier suggestion about the conservative

**Table 1:** Brazil's spending in R&D and innovation (2006-2013)

| Year | 2006 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|
| **BNDES** | | | | | | | |
| (A) Loans | 51,000 | 91,000 | 136,000 | 168,000 | 139,000 | 156,000 | 190,000 |
| Industry (%) | 53 | 43 | 47 | 47 | 32 | 31 | 30 |
| **FINEP** | | | | | | | |
| (D) Loans | 516 | 741 | 880 | 1,218 | 1,735 | 1,765 | 2,521 |
| (D)/(A) | 1.0% | 0.8% | 0.6% | 0.7% | 1.2% | 1.1% | 1.3% |
| **National Expendituresen R&D (DNPD)** | | | | | | | |
| (F) Total | 23,807 | 35,111 | 37,285 | 45,073 | 49,876 | 54,255 | 63,750 |
| (F)/(A) | 47% | 39% | 27% | 27% | 36% | 35% | 34% |
| **R&D and Innovation & Fiscal Waivers** | | | | | | | |
| (F) Total | 2,663 | 5,365 | 4,984 | 5,810 | 5,669 | 6,423 | 6,991 |
| (F)/(A) | 5.2% | 5.9% | 3.7% | 3.5% | 4.1% | 4.1% | 3.7% |
| (G) Informatics Law | 2,038 | 3,261 | 3,103 | 3,571 | 3,772 | 4,482 | 4,844 |
| (G)/(A) | 4.0% | 3.6% | 2.3% | 2.1% | 2.7% | 2.9% | 2.5% |
| (H) Good Law | 228 | 1,583 | 1,383 | 1,727 | 1,410 | 1,477 | 1,604 |
| (H)/(A) | 0.4% | 1.7% | 1.0% | 1.0% | 1.0% | 0.9% | 0.8% |

*Source:* Authors' elaboration based on data from MCTI and BNDES. All figures in millions of reais.

nature of Brazilian industrial policy strategy, which despite belated policy efforts has not yet put innovation at the centre.

**Final considerations**

With this article, we have tried to point out a series of analytic gaps that provide exciting challenges ahead for scholars interested in the new wave of industrial policy in Latin America and especially in Brazil. On a broader level, few longitudinal studies account for the functioning (or collapse) of new coordination mechanisms (CNDI and ABDI), or for the coalitional and ideational dynamics of important emerging industrial policy topics such as innovation and R&D. In these analyses, the role of bureaucracies and scientific communities should receive more attention in building a particular knowledge regime (Campbell & Pedersen, 2014). It is also important to understand the timing of incorporation of new ideas, components, and mechanisms in industrial policy. Narrowing down the scope, there are also few analyses about concrete results of specific industrial strategies. How do these sectoral policies emerge? How are they evaluated and how do their experiences affect other sectors?

We believe that a promising strategy is to promote more grounded sectoral analyses. Informatics, for instance, is one sector that is still alive and kicking in Brazil's industrial policy. The sector has been a pioneer in the use of local content requirements and public procurement to stimulate R&D, despite criticism about the results. The resilience of this sector inspired the creation of a new state-owned company (CEITEC) in 2008, with a mission to build microchips. What are the factors that warrant such resilience? Why are some perspectives and ideas added to the industrial policy repertoire and diffused to other sectors?

Another example of sectoral dynamics that reveals the persistence of traditional mindsets comes from the oil and gas industry. Despite ambitious goals of fostering a competitive and technology-based chain of suppliers, Brazil has so far presented an ill-designed local content requirements policy and a system of R&D incentives with few tangible results. Based on our own research, we can say that the government actually lacks an understanding of supplier networks, and of the international context of a sub-sector such as shipyards. This lack of knowledge stimulated an expansive investment strategy by Petrobrás and other companies in shipyards all over the country. While Petrobrás and shipyards are collapsing after recent corruption scandals, very little is being done to understand (and remedy) why very few of the patents developed by Petrobrás have become commercial products – patents that could strengthen domestic suppliers and increase their competitiveness. Following this thread, the organization of different supply chains and their mechanisms of integration with global value chains is an area of research that has barely been developed in Brazil.

In the end, one could say that Brazil's renewed commitment to industrial policy has been too recent to be properly evaluated. However, as we tried to show, there have been enough changes (and continuities) to give us enough material to assess this comeback. In general, we could say that a combination of conservative ideas about industrial development and embedded bureaucratic resistance has shaped the evolution of Brazil's industrial policy, configuring a strategy that emphasized the role of big domestic companies in industrial development. Looking at Brazil's history, this strategy does not seem much different from previous efforts to industrialize the country.

The recent Petrobrás scandal adds an underlying tension to this story about industrial development efforts and the temptations produced by a competitive electoral system. As political parties have an increasing need for campaign funds, the risk of politicians manipulating state-controlled companies for political gain and of collusion between sitting governments and private companies increases exponentially. The hundreds of millions of *reais* that PT and other Brazilian parties have received as illegal donations in recent years confirms such a fear. Therefore, beyond debating priorities and instruments, an important lesson to be learned from the Brazilian experience is that an open and transparent process of industrial policy formulation and implementation is as important as its results. As for the quality of public debate on this topic, it is not a good sign when academics and criminal investigators are the ones responsible for raising issues and problems concerning such a costly policy.

Unfortunately, despite the enthusiasm showed in many academic and governmental circles, increasing evidence indicates that Brazil has many more issues to lament than to praise regarding its new industrial policy. Nonetheless, both laments and praises inform an important agenda of research that goes beyond the often unproductive debates about being in favour or against industrial policy. Industrial policy will continue to be an important tool at disposal of government. What we need is for scholars to make better, more detailed verdicts about what worked, how it worked, and why it worked in the recent Brazilian experience.

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## Notes

1. As De Toni (2015b:11) states: 'The decision-making process of the industrial policy is bumpy, with many asymmetries of power, information, and heterogeneous technical capacities. The situation is intensified by the poorly resolved co-existence of competing strategic plans in each ministry.' Translated by the authors.
2. Considering the existence of this institutional setting for the formulation and implementation of industrial policy in Brazil, it is at least ironic that economists from BNDES have recently argued for more coordination without even mentioning CNDI or ABDI. As Kupfer et al. (2013, p. 339) state: 'Effective industrial policies require effective coordination at all levels: among public agencies; among private entities; and between public and private actors. Efforts along these lines should be at the forefront of the agenda of all relevant actors.'
3. BNDESPAR is a BNDES's subsidiary that owns equity in companies. It was created to help companies to raise capital in the Brazilian stock market.

4. Discussions of innovation started in the preparations for the so-called ‘Green Book’ (Silva & Melo, 2001), which was the first official industrial policy document ever to mention the term. See also Lopes & Balbachevsky (2013).

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