

Note on the concept and measurement of the industrial equilibrium

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CND/EAESP/FGV, August 2020

I originally introduced the concept of “industrial equilibrium” in the 2008 paper on the Dutch disease, “The Dutch disease and its neutralization: A Ricardian approach”. While the *current equilibrium* is the exchange rate that balances intertemporally a country’s current-account, the *industrial equilibrium* is the competitive exchange rate – the exchange rate that makes competitive the companies or the investment projects that use the best technology available in the world in producing manufacturing goods, or, more precisely, the companies producing tradeable non-commodity goods and services which are productively sophisticated, have a high value-added per capita and pay higher wages. In this case, we have two equilibriums: the current equilibrium, around which the exchange rate floats, and a more depreciated industrial equilibrium exchange rate.

When I was writing my 2008 paper, I knew that I was adopting a rigorous concept of industrial equilibrium, but not an impossible objective. Many industrial sectors were meeting this criterion when Brazil was industrializing and becoming a major exporter of manufactured goods. Even today there are industries that meet it. On the other hand, I never had sympathy for protectionism. While the country is in the stage of infant industry, import tariffs on manufactured goods do not represent protectionism. Once, however, this stage is overcome, there is not anymore good reasons to protect that given industry. The developing country has some competitive advantages (mainly lower labor costs) and should be able to industrialize and catch up beginning by the less sophisticated industries, and gradually moving its manpower to more sophisticated ones, whose competitiveness is less dependent on the exchange rate due to their relatively monopolistic character.

This concept of industrial equilibrium has now been object of a critique by three new-developmental friends, José Luis Oreiro, Paulo Gala and Luciano D’Agostini, in the paper “Deindustrialization, Economic Complexity and Exchange Rate Overvaluation: the case of Brazil (1998-2017)”. They say they disagree in relation to the method, but actually they present a different concept of industrial equilibrium. They have two arguments:

first, that the industrial equilibrium that the Center for New Developmentalism have being calculating in the last years under the supervision of Nelson Marconi is too low, lower than the present exchange rate which suffered a high depreciation this year;

second, that our concept is too rigorous: that countries like Brazil are underdeveloped countries incapable to adopt the best technology available in the world.

The first problem is not really a problem. According to the New-Developmental Theory (NDT), the exchange rate in developing countries follows a cyclical behavior. Each cycle begins and ends with a financial crisis and the sharp depreciation of the local money, which turns the rate higher (more depreciated) than the industrial equilibrium. This is today the case of the Brazilian economy. The last exchange rate cycle, which began in 2002, ended in 2014, when the exchange rate increased over the industrial equilibrium. Since then, however, the exchange rate did not appreciate back – what means the financial crisis was not really overcome as we can infer from the huge capital outflows. A similar extended crisis happened in the previous cycle in which the final crisis went from the end of 1998 to the beginning of 2003.

First, the concept. What to say about the proposal of a new concept for the industrial equilibrium? The three economists define the industrial equilibrium as “the level of the exchange rate that allows domestic companies, given the current level of technological gap, to be competitive in the international market”, and operationalize it: the industrial equilibrium is “the real exchange rate that, for a given level of technological gap, makes the share of manufacturing industry on real output constant over time”, or, in other words, industrial equilibrium is the exchange rate that protects the manufacturing industry. This is a mistaken concept of the industrial equilibrium; a concept associated to the infant industry argument, with the difference that the manufacturing industry will remain “infant” for long; it is a concept that has no theory behind – just protectionist claim, which is expressly admitted when they want that the exchange rate compensate a “technological gap”. The New-Developmental Theory admits import tariffs in the classical Hamiltonian-Listean condition, when we have an infant industry, and it added a second condition which is new in the economic literature: the import tariff neutralizing the Dutch disease. When a country uses import tariffs on manufactured goods to neutralize the Dutch disease in relation to the domestic market, these tariffs are also not protectionist.¹ What the NDT defends firmly are *equal conditions in competition* for the industrial companies – a condition which the market does not provide when the Dutch disease keeps overvalued the national currency in the long-term. The Dutch disease is a major market failure because basic economics teaches that a competent company is necessarily a competitive company, and that is not the case when the country suffers from this competitive disadvantage.

Second, the base year. The method of measuring the industrial equilibrium that our three authors propose is equally mistaken. To measure the variation of the industrial equilibrium through time and build a time series we must have a *year-base* in which both the industrial equilibrium and the real exchange rate are equal. The New-Developmental Theory adopts as criterion to define this year-base that the country, in this year, exhibits a moderate current-account surplus. A surplus because when a country has the Dutch disease its current-account equilibrium will correspond to a current-account surplus. A moderate surplus, because the Dutch disease in Brazil is not severe as it is, for instance, in Venezuela or in Saudi Arabia. Following these two conditions, which are inferred from the new-developmental model of Dutch disease, we in CND chose 2005 as the year-base. Instead, our three economists have chosen 2001. Why, because in this year the share of industry in GDP was equal to 2000. Well, if this was a good criterion, why 2001 and not 1997, 2007 and 2019 – years in which the same constancy happened. By the way, a small deficit but anyway, a deficit, when the country should

have a current-account surplus. Why such constancy criterion? Why is a country in the industrial equilibrium when the current-account deficit to GDP is constant for two years? There is no good reason; again there is no theory behind. Defining the year-base industrial equilibrium as the one that prevails when the share of manufacturing industry in GDP is constant does not indicate that the country's currency is technologically and commercially competitive. A country may have the share of industry in GDP constant for a short period but in this period the exchange rate is not necessarily competitive for the manufacturing industry. Suppose that the exchange rate is overvalued, the industrial productivity is stagnant, and the country is deindustrializing. The share of industry in GDP may, very well, be constant for two years while the exchange rate remains overvalued if we suspend the productivity stagnation assumption. In the second year an increase in productivity may have compensated the overvaluation and has kept the manufacturing current-account constant. Or we may maintain the stagnation of productivity assumption, but the second year has experienced an improve in the manufacturing terms of trade that, also, have compensated the overvaluation. The manufacturing current-account may remain constant for some time while the exchange rate remains overvalued (or remains depreciated) because the change in imports and exports caused by this overvaluation/depreciation requires some time to become effective, or because policymakers (in developing countries) are happy with a current account deficit on the mistaken argument that "the deficit is allowing them to grow with foreign savngs".

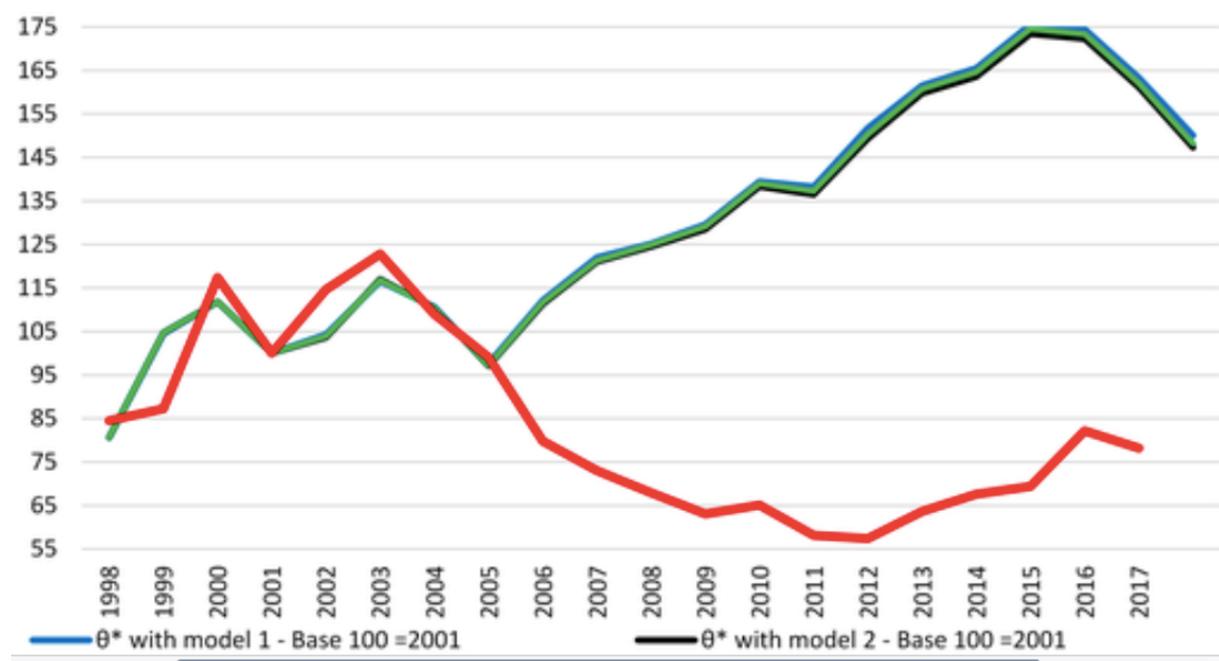
Third, the variations of the industrial equilibrium through time. Defined the year-base, how to define the variations through the years? In 2012, I had just developed the concept of the *value of the foreign money* that I believe to be a significant progress in the theory of the determination of the exchange rate. And have shown that variations in this value around which the price, the exchange rate, floats depends on the comparative unit labor cost index.² The comparative unit labor cost index is often used to indicate if the exchange rate is overvalued or undervalued, but with no theory behind. This, for instance, was the method that European economists and myself with Pedro Rossi used to calculate the *internal exchange rate* between the countries of the Euro Zone in the 2010-16 crisis.³ Thus, I proposed to Nelson Marconi, who has been my closer associate in developing the NDT, to use this value theory and the respective comparative index to make the estimation of the variations of the industrial equilibrium. This was a solid theoretic foundation. In this theory, the value of the foreign money depends on the variations on the unit labor cost of the country in comparison with the unit labor cost of a basket of competing countries.

Forth, the transformation of an index into a price. But we, at the Center for New Developmentalism – CND, had a final problem: how to express this comparative index in reais per dollar. Marconi, with the support of his associated assistant, Marco Capraro Brancher, developed the method to make this conversion. The paper on methodology of measuring the industrial equilibrium was ready to be published. We were supposed to sign together the paper, but Marconi had done a lot of work, and I suggested that he signed the paper alone.⁴ How did proceed our three economists after choosing their year-base? Instead of using the comparative unit labor cost index, they used Hidalgo and Hausman's complexity concept as a proxy for the technological gap. Indeed, as our three authors say, "an increase in the economic complexity

of a given country will reduce the level of real exchange rate that is compatible with the stability of the manufacturing share”. No doubt, but why to use the complexity index which is not a theory but an empirical confirmation of the Classical-Developmental Theory definition of growth as *structural change*. It is not a specific theory directly associated to the exchange rate, as it is the new-developmental value of foreign money theory measured by the comparative unit labor cost index.

Which was the outcome of their work? The paper presents the figure below, that is not transformed into reais per dollar. A strange figure in which the green line represents the industrial equilibrium and the red line, the real exchange rate. Instead of trying to use it to understand what happened recently in the Brazilian economy, I here reproduce a section of the fourth edition of my book, *A Construção Política do Brasil*, which Editora 34 will soon publish in Portuguese; it is a good an example of the use of the CND’s industrial equilibrium in reais per dollar time series –.⁵

Figure 2 – Time series for the industrial equilibrium real exchange rate, models 1, 2 and 3, during 1998-2017 compared with the real effective exchange rate, base 100 = 2001.



The 2002-2014 exchange rate cycle

This brief analysis will appear in the fourth edition of *The Political Construction of Brazil*. I am including it here so that readers have an example of the type of analysis of economic reality that can be done with the help of the concept of industrial equilibrium.

The last exchange rate cycle began in 2003, when PT was starting to govern, and ended in 2014, when the economy faced a new financial crisis and has fallen into recession: it began after a high depreciation of the real and closed with another depreciation. To understand this

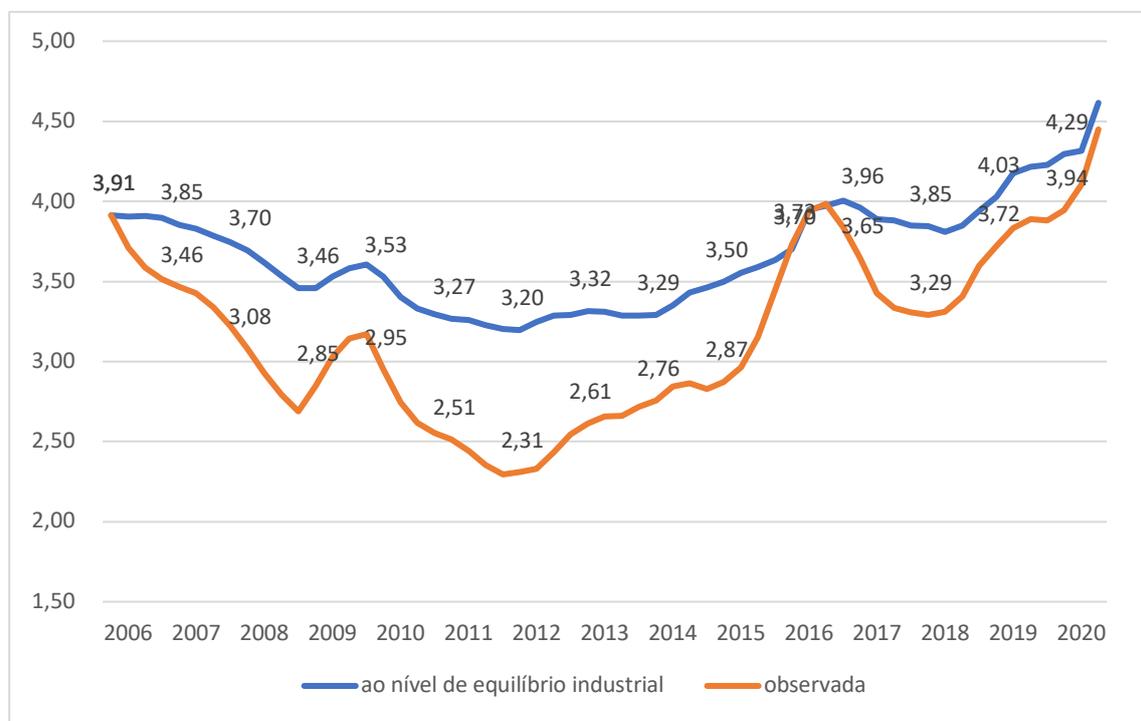
crisis, let us now look at this cycle. Virtually all schools of economic thought understand that the investment rate is the main determinant of the growth rate. The Keynesian Economic Theory added that the investment rate depends on the expected rate of profit, which, on its turn, depends on demand. The New-Developmental Theory added that the existence of a demand does not assure that the manufacturing companies that utilize the best technology in the world will invest. It is also necessary they have access to both the foreign and the domestic demand. Now, if the exchange rate is not simply volatile, as is generally thought, but, in developing countries, it tends to remain appreciated for several years, the competent companies *will not have access* to demand and will not invest. The exchange rate remains overvalued *within* exchange rate cycles. Thus, we may say that the exchange rate is like a *light switch* that connects to or disconnects the good companies from their markets or their demand. Left free, the exchange rate presents this cyclical behavior: it depreciates strongly in the financial crisis that ends the previous cycle; once this crisis is overcome, it starts to appreciate, crosses the curve of the industrial equilibrium, crosses the curve of the current equilibrium, enters the area of current-account deficits, and remains appreciated for several years, while the accumulated deficits originate a costly and dangerous foreign debt. This appreciation after the crisis happens because the market works again and brings the exchange rate not just to the current equilibrium but below it because the developing country is engaged in the mistaken growth with current account deficits and foreign indebtedness policy. The appreciation process does not stop in the current equilibrium but enters the area of the current account deficit because, for some time, the foreign creditors are happy with the high interest rate they are benefiting of, but, finally, they lose confidence, suspend the rollover of foreign debt, and a new financial crisis with the respective depreciation of the debt breaks up putting an end to the exchange rate cycle.

Other economic theories do not attribute this strategic role to the exchange rate because their assumption is that the exchange rate is simply volatile in the short run, fluctuating around the current equilibrium. If this was true, when companies make the devaluation of its investment projects, it would take into consideration this competitive equilibrium and would invest. But, as in developing countries like Brazil the exchange rate may remain appreciated for several years within the exchange rate cycle. In this case, the company will look to this rate when it makes its investment decision, realize that the exchange rate is making uncompetitive its investment project despite the technology in the world state of the art that it plans to adopt, and doesn't invest.

This happened in Brazil between 2002 and 2014. To build our industrial equilibrium series, which is in Figure 8, we choose 2005 as the base year, because in this year there was a current account surplus, as the Dutch disease model predicts when the disease is zeroed. Thus, in this year, the real exchange rate and the industrial equilibrium were the same. In the following years, however, the exchange rate appreciated strongly, because the prices of commodities increased due to a price boom. In those years, between 2005 and 2011, while the price of commodities continued to grow, the exchange rate appreciated in real terms reaching a bottom of R \$ 2.31 per dollar in 2011. In this period, the industrial equilibrium line also dropped to a minimum of R \$ 3.20 per dollar – this through meaning that the unit labor cost (average wage

divided by productivity) between 2005 and 2011 decreased more in Brazil than in its main competitors.

Figure 8: The real exchange rate and the industrial equilibrium (2005-2019)



Source: EAESP / FGV Center for New Developmentalism. Observ: Index 2005 = 100. Annual moving average. R \$ against US \$, December 2019 prices.

Yet, as of 2011, the two curves started to rise: the industrial equilibrium rose because wages began to increase more than productivity and, so, the unit cost of labor began to grow more in Brazil than in its competitors. While this was happening, the slight fall of the commodity prices caused the exchange rate to begin to depreciate, but it continued well below the industrial equilibrium, meaning that the manufacturing industry continued not competitive in commercial or economic terms, presenting a very low profit rate if not loss. In 2014, however, the price of commodities exported by Brazil has fallen sharply, the manufacturing companies lost credit and stopped investing and a financial crisis broke-up making the exchange rate to depreciated sharply to keep competitive the commodities. In this year, the exchange rate cycle closed, while the exchange rate crossed the industrial equilibrium curve at R \$ 3.75 per dollar, thus zeroing again the Dutch disease.

As of 2015, however, the exchange rate appreciated again, but this appreciation did not indicate the beginning of a new cycle. The real is now appreciating not due to a further increase in the price of commodities (which did not occur), but because the exchange rate had depreciated too much in the previous year – had experienced an overshooting that the market was then correcting. Finally, from the end of 2019, the exchange rate experience a new depreciation, this time not due a financial crisis, as it had happened in 2014, but due (a) to the

sharp drop in interest rates that the Central Bank was forced to make due to fall of the inflation rate below its target, caused by the 2014- 2016 recession and the weak 2017-19 recovery; (b) due to the distrust of the international financial market towards the Brazilian economy and its government; and (c) due the Covid-19 pandemia that caused the appreciation of the dollar in all markets. On the other hand, the industrial equilibrium, which had fallen in 2017 and 2018, rose again in 2019 and 2020 because the reduction in wages in Brazil caused by the pandemic was less than that which occurred in the competing countries and because productivity continued stagnant in Brazil due to the lack of investments in the manufacturing industry, while it continued to grow in the competing countries. In the figure, however, the exchange rate did not cross the industrial equilibrium, whose higher value is R\$ 4,29 per dollar. This, for statistical reasons, because we use a moving yearly average. Calculating the industrial equilibrium only in the first quarter of 2020, it reached R\$ 5.25 per dollar. Such high real exchange rate indicates that the confidence crisis the Brazilian government is facing since the beginning of 2015 worsened in 2020, when I finished writing this fourth edition of this book; the high industrial equilibrium, the low productivity of the Brazilian manufacturing industry after so many years of low investments and deindustrialization.

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¹ Bresser-Pereira (2008, 2020).

² Bresser-Pereira (2013).

³ Duwicquet, Mazier and Saadaou (2013); Bresser-Pereira and Rossi (2015).

⁴ Marconi (2012).

⁵ There is a 2017 English translation of this book published by Lynne Rienner Publishers.