

**Título:** The rise and fall of the Brazilian economy (2004-2015): *the economic antimiracle*

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**Abstract:** The aim of this paper is to interpret the recent trajectory of the Brazilian economy, from around 2004 to 2015, focusing on the interaction between demand, income distribution, and the productive structure. An interpretative hypothesis is formulated within a framework that combines an effective demand schedule from the Kaleckian growth and distribution literature and a distributive schedule of Goodwin heritage (following Taylor, 2004, and Barbosa-Filho and Taylor, 2006). Such hypothesis indicates the determinants of the growth acceleration and of the increase of the wage share on income that started around 2004, as well as the determinants of their later reversal. Then, the framework is modified to incorporate sectoral heterogeneity, as suggested by Rugitsky (2016), and a modified hypothesis points out that a cumulative process involving reductions of wage inequality and changes of the productive structure may explain part of the recent Brazilian trajectory. Both hypotheses are examined empirically. The contrast of the cumulative process suggested with the one that seems to have taken place during Brazil's "economic miracle" (1968-1973) allows it to be called an economic antimiracle.

**Keywords:** aggregate demand, income distribution, productive structure, Kalecki, Goodwin, Brazilian economy

**JEL Codes:** E11, N16, O11, O54

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**Resumo:** O objetivo desse artigo é interpretar a trajetória recente da economia brasileira, entre 2004 e 2015, enfocando a interação entre demanda, distribuição de renda e a estrutura produtiva. Uma hipótese interpretativa é formulada a partir de um arcabouço que combina uma relação de demanda efetiva extraída da literatura kaleckiana sobre crescimento e distribuição e uma relação distributiva que remonta a Goodwin (seguindo Taylor, 2004, e Barbosa-Filho e Taylor, 2006). Tal hipótese indica os determinantes da aceleração do crescimento e do aumento da parcela dos salários na renda que se iniciaram por volta de 2004, assim como os determinantes de sua reversão posterior. Em seguida, o arcabouço é modificado para incorporar heterogeneidade setorial, como sugerido por Rugitsky (2016), e uma hipótese modificada aponta que um processo cumulativo envolvendo reduções na desigualdade salarial e mudanças na estrutura produtiva pode explicar parte da trajetória brasileira recente. Ambas as hipóteses são examinadas empiricamente. O contraste entre o processo cumulativo sugerido e o que parece ter ocorrido durante o "milagre econômico" brasileiro (1968-1973) permite chamar o primeiro de antimilagre econômico.

**Palavras-chave:** demanda agregada, distribuição de renda, estrutura produtiva, Kalecki, Goodwin, economia brasileira

**Códigos JEL:** E11, N16, O11, O54

# THE RISE AND FALL OF THE BRAZILIAN ECONOMY (2004-2015): THE ECONOMIC ANTIMIRACLE

## 1. Introduction

Several South American countries are in the midst of economic crises and mounting political turmoil, after having gone through a decade of relatively high economic growth rates and falling income inequality. The so-called progressive governments that came to power in the turn to the 21<sup>st</sup> century – and are sometimes identified as a pink tide – have already been replaced by right-wing adversaries in Argentina and Brazil and are facing growing challenges in countries like Ecuador and Venezuela. And the gross domestic products (GDP) of Argentina, Brazil and Venezuela have decreased in at least some of the last few years. There is an unmistakable feeling of end of cycle throughout. The period from 2004 to 2011 was characterized, in pink tide South American countries, by an unusual (at least locally) trajectory in which economic growth accelerated and inequality was reduced. Although virtuous, this dynamic proved short lived. The impact of the reversal of commodities' prices on growth has been uneven across countries, but the average rate of growth for the six selected countries during the period between 2012 and 2015 is lower than the one obtained in the 1990s (Table 1). And the prospects for inequality reduction are similarly gloomy, amidst rising unemployment. Hence, it is important to assess this recent trajectory, examining its determinants and limits, in order that its lessons can be learned.

*[TABLE 1 AROUND HERE]*<sup>1</sup>

The present paper focuses exclusively on the macroeconomic dynamic, especially the interaction between economic growth, income distribution, and the productive structure, aware that it may provide only preliminary hypotheses that should be analyzed in the context of a larger multidisciplinary assessment. It also restricts its purview to the case of Brazil. It aims to analyze the determinants of the growth acceleration and of falling inequality and to examine the potential interaction of these two dynamics, in the Brazilian case. While the comparison of the countries' trajectories might be very useful to identify the foreign and domestic determinants of the recent experience, through an examination of what is common to most of them and what are the national particularities, this paper will investigate only one country, leaving such comparisons to future work. Its specific contribution is to suggest a way to bridge the gap between the growing literature on the recent trajectory of the Brazilian economy (which is, so far, mostly descriptive) and the literature that attempts to apply the Kaleckian growth and distribution framework to Brazil (but focuses mainly on policy implications, rather than interpretation of growth episodes).<sup>2</sup>

## 2. First Hypothesis

### 2.1. Theoretical framework

In order to examine the interaction between income distribution and aggregate demand in Brazil, one can resort to a framework in which the short-run equilibrium levels of the degree of capacity utilization and of the wage share of income are simultaneously determined by the intersection of two schedules that represent equilibrium in the goods and in the labor markets. Such framework, in this version due to Taylor (2004: chaps. 4 and 7), can be interpreted as a strand of the Kaleckian growth and distribution literature (see Blecker, 2002, and Lavoie, 2014: chaps. 5-7, for summaries). Whereas Dutt (1984: 32-35), in his seminal Kaleckian model, had already considered the effect of growth on distribution and, thus, examined the interaction between the effective demand and the distributive schedules, he considered that each schedule belonged to a different temporal dimension. The effective demand schedule, the Kaleckian IS, represented the short-run equilibrium in the goods market, as

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<sup>1</sup> The periodization suggested in Table 1 will be adopted throughout this paper, except in a few arguments. All periodizations are, to some degree, arbitrary, but the suggested one seems to fit adequately the most relevant features of recent Latin American economic history, in general, and of the Brazilian case, in particular. It is also useful to mention that the period from 1990 to 2003 is called "neoliberalism" for lack of a better name, given that there was no unambiguous break with neoliberal policies after 2004.

<sup>2</sup> Examples of the former are Barbosa-Filho and Souza (2010), Serrano and Summa (2012, 2016), Palma (2012), Côrrea and Santos (2013), Paula, Modenesi and Pires (2015), among others. The latter comprises especially Araújo and Gala (2012), Oreiro and Araújo (2013), Carvalho and Rugitsky (2015), Tomio (2016), and Gonçalves (2016).

determined by the functional distribution of income – that is, the distribution of income between wages and profits. The causality in the other direction, that is, the impact of growth on distribution, would only be felt in the long run, when the economy would move to the intersection of the two curves. However, Taylor’s (2004) approach, following the trail opened by Goodwin’s (1967) model (something that is clearer in Barbosa-Filho and Taylor, 2006), assumes that both schedules refer to short-run adjustments and that the dynamic derived from the interaction between them can generate short-run cycles.<sup>3</sup>

The effective demand schedule, in its baseline version (Rowthorn, 1981, Dutt, 1984, Taylor, and Bhaduri and Marglin, 1990), reflected the impact of functional income distribution on the degree of capacity utilization through two channels.<sup>4</sup> First, by assuming different propensities to consume out of wages and profits (originally, the propensity to save out of wages was assumed to be zero), a redistribution of income towards wages, that is, an increase in the wage share, would result in an increase of aggregate consumption, as the propensity to consume out of wages is assumed to be higher. Second, following Steindl’s (1952/1976) research, aggregate investment was assumed to be a positive function of the degree of capacity utilization and of the profit share. The impact of a rising wage share on it would be ambiguous, depending on the parameters. Originally, with a specific linear investment function and no saving out of wages, aggregate demand was unambiguously wage-led, that is, the derivative of capacity utilization on the wage share was positive. But extensions of the model, incorporating more general investment functions, positive propensity to save out of wages and open economy effects (Blecker, 1989, Bhaduri and Marglin, 1990, Taylor, 1990), soon showed the possibility of both wage- and profit-led demand regimes.

To keep things simple, the effective demand schedule will be represented as a linear curve in the  $(u, \psi)$  plane, where  $u$  stands for the degree of capacity utilization and  $\psi$ , for the wage share of income. A downward-sloping curve indicates, then, profit-led demand and an upward-sloping one, wage-led demand. As mentioned, the potential nonlinearity of the two schedules has been discussed (Nikiforos and Foley, 2012, Oreiro and Araújo, 2013, Carvalho and Rugitsky, 2015; see also Bhaduri and Marglin, 1990: 392-393, and Taylor, 1990: 329-333), but will not be considered in the present paper, being left for future research. The baseline version of the effective demand schedule can be formally represented as the isocline in which  $\dot{u} = 0$ , where a dot over the variable represents its derivative in relation to time – that is,  $\dot{u} = du/dt$  (see Nikiforos and Foley, 2012, for instance). If the rate of change of the degree of capacity utilization depends on the difference between investment and saving – such that  $\hat{u} = I(u, \psi) - S(u, \psi)$ , where  $I$  is investment,  $S$  is savings and a hat over the variable denotes its rate of change (that is,  $\hat{u} = \dot{u}/u$ ) –, then  $\dot{u} = 0$  requires that  $I(u, \psi) = S(u, \psi)$  for strictly positive values of  $u$ . Hence, the slope of the schedule (and the demand regime) depends on the sign of  $\frac{du}{d\psi} = \frac{S_{\psi} - I_{\psi}}{I_u - S_u}$ , with subscripts denoting partial derivatives.<sup>5</sup>

The causality in the other direction, from growth to distribution, has been less studied. In Dutt’s (1984: 32) formulation, the distributive schedule was determined by the long-run impact of growth on the market structure, on “industrial concentration rates.” Given Kalecki’s argument that the functional distribution of income was determined by the mark-up and that the latter, in its turn, reflected the “degree

<sup>3</sup> The recent literature that is critical of the concept of demand regimes (Skott, 2016, for instance) argues in terms of Taylor’s approach, claiming that distribution cannot be assumed to be exogenous, even in the short run. By restricting the distributive schedule to the long run, Dutt (1984) was implicitly assuming short-run exogeneity. As usual, disputes on exogeneity are disputes on temporality. In addition, the controversy is explained by different interpretations of the determinant of the functional income distribution. Taylor’s approach root it, mostly, in labor market dynamics and, consequently, consider it a short-run phenomenon. (It is also dependent on the dynamics of labor productivity.) Dutt, in his turn, claims that the functional income distribution is determined by the long-run transformations of market structures, that is, of industrial concentration.

<sup>4</sup> In light of the widespread existence of idle productive capacity, the equilibrium between investment and saving is thought to be brought about by changes in the degree of capacity utilization. In this sense, the degree of capacity utilization is determined by effective demand.

<sup>5</sup> Usually, the so-called Keynesian stability condition is assumed, implying that the denominator is negative and that the slope of the effective demand schedule depends only on the sign of the numerator. However, as argued by Nikiforos and Foley (2012: 204), in a framework that puts together both schedules, the stability of the whole model does not require that the Keynesian stability condition be valid. See also Skott (2012).

of monopoly,” the long-run trajectory of industrial concentration would impact the wage share of income.<sup>6</sup> In this paper, the approach adopted will be Taylor’s (2004), in which the distributive curve is determined by the cyclical behavior of real wages and labor productivity and can be thought as an outcome of the labor market. The wage share of income is, by definition, the ratio of the real wage to labor productivity. Formally,  $\psi = wL/PY = \omega/x$ , where  $\omega = w/P$  is the real wage (with  $w$  and  $P$  denoting, respectively, the nominal wage and the price level) and  $x = Y/L$  is labor productivity (with  $Y$  and  $L$  denoting, respectively, output and the number of workers employed). Thus, the distributive schedule is the isocline defined by  $\dot{\psi} = 0$ , which, given that  $\hat{\psi} = \hat{\omega} - \hat{x}$ , requires that  $\hat{\omega} = \hat{x}$ , for strictly positive values of  $\psi$ . Assuming that the rate of change of the real wage and of labor productivity are both functions of the wage share of income and of the degree of capacity utilization, the slope of the distributive schedule can be defined as  $\frac{d\psi}{du} = \frac{\hat{x}_u - \hat{\omega}_u}{\hat{\omega}_\psi - \hat{x}_\psi}$  (Barbosa-Filho and Taylor, 2006, Nikiforos and Foley, 2012).

Intuitively, both the rates of change of the real wage and of labor productivity tend to accelerate as the degree of capacity utilization increases, due respectively to a tightening of the labor market and to technological factors such as economies of scale or learning by doing – so-called labor hoarding could also explain a pro-cyclical behavior of labor productivity. The question, then, is which accelerates more. If real wages grow ahead of labor productivity, as the degree of capacity utilization increases, the wage share rises and the economy would be characterized by a profit-squeeze distributive schedule, with a positive slope in the  $(u, \psi)$  plane. Alternatively, if the rate of change of labor productivity tends to respond stronger than that of real wages to changes in the degree of capacity utilization, a wage-squeeze distributive schedule would result.<sup>7</sup> Nonlinear dynamics are especially plausible in that case, with, for instance, real wages responding little to increases in the degree of capacity utilization for low levels of the latter and increasing faster when the degree of capacity utilization is high (Nikiforos and Foley, 2012). In addition, the sectoral dynamics of growth tend to be a seldom examined, but particularly relevant, determinant of the slope of the distributive schedule, an issue that will be further addressed below.

Putting together both schedules, one obtains at least four possible varieties of interaction between demand and distribution: wage-led/wage-squeeze, profit-led/wage-squeeze, wage-led/profit-squeeze, and profit-led/profit-squeeze (Taylor, 2010: 188).<sup>8</sup> The task, then, is to identify which is more adequate to interpret specific economic episodes. The next subsection is devoted to analyzing the recent Brazilian trajectory along these lines.

## 2.2. Demand and distribution in Brazil

Plotting Brazil’s labor share of income and degree of capacity utilization, for the period between 2000 and 2014, in the  $(u, \psi)$  plane, one obtains Figure 2, below.<sup>9</sup> Resorting to the framework presented previously, the aim is to provide an interpretative hypothesis for, first, the parallel growth of both the degree of capacity utilization and the labor share of income between 2004 and 2008 and, second, the trajectory since the crisis, with continuing increase of the labor share of income until 2013 but decreasing degree of capacity utilization (slowly at first and sharply afterwards). Following Gonçalves (2016), it is assumed that the Brazilian economy can be described, during the relevant period, by a profit-led demand regime and a profit-squeeze distributive schedule, as in Figure 3a, below.<sup>10,11</sup> In such a framework, the

<sup>6</sup> On Kalecki’s distribution theory, see Rugitsky (2013).

<sup>7</sup> That is true only if  $\hat{\omega}_\psi - \hat{x}_\psi < 0$ , which is what Barbosa-Filho and Taylor (2006) find in an econometric investigation of the United States’ economy.

<sup>8</sup> There can be more varieties, given different assumptions about the stability of each of the schedules. See, on this issue, Bhaduri (2008) and Lavoie (2014: 381-386).

<sup>9</sup> Details on the data can be found in appendix 3, which can be provided upon request.

<sup>10</sup> Araújo and Gala (2012) estimate the growth regime rather than the demand one, but if the former is profit-led (which is the result they obtain) it is likely that the latter will be as well (see Blecker, 2002). Oreiro and Araújo’s (2013) definition of growth regime is different, as seen above, but they obtain a profit-led one, as well, from 2005 onwards. Only Tomio’s (2016) estimates point in the direction of a wage-led demand regime. Different assumptions about the demand regime would change, but not invalidate, the interpretation below. Appendix 4, available upon request, examines two other possibilities.

economy does not need to be always in equilibrium, that is, in the intersection of the two schedules. It does not even need to converge to it – in Goodwin’s (1967) formulation, for instance, the economy would continuously cycle around it. But there seems to be plausible evidence, regarding variables that can shift the two schedules, that the trajectory starting around 2004 cannot be interpreted simply as an out-of-equilibrium dynamics around a fixed equilibrium point, but rather reflected a change in the equilibrium itself (due to shifts of the schedules).

[FIGURE 2 AND 3 AROUND HERE]

Beginning with the effective demand schedule, at least four factors seem to have moved it outwards (in Figure 3b, from ED to ED’): i) a decrease in wage inequality; ii) an increase in household borrowing; iii) an increase in public investment; and iv) a positive terms of trade shock. As noted above, there is growing evidence that the fall in inequality previously identified was overestimated (Medeiros, Souza and Castro, 2015, Medeiros and Souza, 2016), mainly due to the underestimation of capital income by household surveys. Consequently, the inequality reduction seems to have been mostly a reduction of wage inequality and indicators like the Gini coefficient and income ratios estimated from household surveys may give a good approximation of its decline (Medeiros, 2015: 67, fn. 29). Figure 4, below, show a slow fall in inequality during the 1990s and a quicker fall in the subsequent period. Figure 5 offers another measure of wage inequality, the ratio of the average to the minimum wage, taking into account wages observed in six Brazilian metropolitan areas. It decreases from around 4 in 2002 to 2.82 in 2011 and from then onwards it remained practically stable around 2.70 (see Carvalho and Rugitsky, 2015: 3-6, for further discussion of this issue, focusing on the role of the minimum wage).<sup>12</sup>

This fall in wage inequality can be attributed to different determinants, from policies that increased the bargaining power of workers in the bottom of the income distribution (like *Bolsa Família* – a conditional cash transfer program established in 2004 [Lavinhas, 2013: 25-34, and also Soares and Sátyro, 2009, and Campello and Neri, 2013] – and an acceleration of the rates of growth of the minimum wage) to a transformation of the sectoral job structure that raised the share of low-paying jobs, something that will be further examined below (Medeiros, 2015: 79-108). Even conventional analyses, focused on the role of education, tend to examine the interaction between the supply of skill and the demand for skilled labor, that is, between the workforce level of instruction and the job structure (see, for instance, Fernandes and Menezes-Filho, 2012, and Pecora and Menezes-Filho, 2014). A worker that has just concluded higher education does not necessarily find a job adequate for his level of instruction if the job structure is shifting towards sectors that predominantly demand unskilled workers. Hence, the relative roles of expanding educational opportunities and of a transformation of the job structure in the recent decline in wage inequality deserves further research.

[FIGURES 4 AND 5 AROUND HERE]

Reinforcing the demand impulse given by falling wage inequality, a steep increase in household borrowing was observed in the period, especially since 2004. The observed increase in mass consumption was, thus, a result of both rising wages in the bottom of the wage distribution and rising debt (Santos, 2013: 184-198, Serrano and Summa, 2016: 813-816; see also Schettini et al., 2012, for econometric evidence about the determinants of consumption and a review of the available literature on the subject). Total credit operations to individuals as a share of GDP (Figure 6) took 16 years, from 1988 to 2003, to grow about 5 percentage points, from around 1 to around 6 percent. Then, in the 6 years from 2004 to 2009, it reached 14.9 percent of GDP, growing almost 9 percentage points. Such increase in household borrowing is one of the factors that explain the trend reversal of the series of total credit operations as a share of GDP, which fell almost continuously from a peak of just below 37 percent in 1994 to a trough of around 22 percent in 2002 and then started growing, reaching 45 percent in the end of 2009 (Figure 6).

<sup>11</sup> The arrows of Figure 3a assume that both schedules are locally stable, which is not necessary for the model as a whole to be stable. In the case of the effective demand schedule, this means that the Keynesian stability condition holds. Different assumptions would imply different out-of-equilibrium dynamics. This issue could be further explored.

<sup>12</sup> Still another evidence of such compression of wage disparity is the fact that, between 2006 and 2011, the share of workers that earn between 1 and 5 minimum wages grew from 54 to 61.2 percent, while the shares of workers that earn less than a minimum wage and more than 5 declined: respectively, from 36.1 to 29.9 percent and from 10.0 to 9.1 percent (Medeiros, 2015: 95, table 4). Thus, the middle of the distribution became larger as the tails became smaller.

Unfortunately, this series has been discontinued by the Brazilian Central Bank, but a series on household debt as a share of disposable income, available since 2005, indicates that the trend continued until 2011: household debt (excluding mortgage loans) represented 17.3 percent of disposable income in 2005, 31.2 percent in 2011, 27.2 percent in 2015, and 24.7 in 2016. The legal establishment, in 2004, of a new kind of credit with automatic repayments from the paycheck, known as *crédito consignado*, is one of the explanations for this rising borrowing, along with the gradual reduction of interest rates, allowed for by abundant international liquidity and declining interest rates around the world (Serrano and Summa, 2012: 56-69, Serrano and Summa, 2016: 813-816). In addition, growing income in the bottom of the distribution and the formalization of the labor market were also important, by giving access to the financial system to numerous households that were previously beyond its reach, thus reducing credit constraints (Santos, 2013: 188-198, Carvalho and Rugitsky, 2015: 9-10, Serrano and Summa, 2016: 813-816).<sup>13</sup>

[FIGURE 6 AROUND HERE]

The increase in public investment that began in 2004 is also noteworthy (Orair, 2015b, 2016). As Table 2 shows, after experiencing negative average real rates of growth both in the 1980s and in the 1990s, public investment grew on average 10.9 percent between 2004 and 2011 (despite the large reduction observed in 2011). Both direct investment by government and investment by state enterprises contributed to this increase, which increased public investment as a share of GDP from 2.66 to 4.09 (between 2004 and 2011). There is evidence that public investment stimulates private investment in Brazil (Santos et al., 2016b), explaining the visible correlation between public investment and gross fixed capital formation (GFCF) as shares of GDP, in Figure 7, below. Indeed, GFCF grew on average 7.97 percent per year between 2004 and 2011, after being almost stagnated for the quarter of century since 1980 and actually falling as a share of GDP. The growth of investment by state enterprises can be accounted for, to a large degree, by rising investment by Petrobras, the Brazilian oil firm.<sup>14</sup> This seems to have followed the discovery of new reserves and the rising trajectory of oil prices and is, in this way, related to the commodity boom. Direct investment by the government, in its turn, was raised deliberately, something that involved excluding such expenditures from the computation of the primary fiscal surplus – investment by Petrobras were also excluded from 2009 onwards (Orair, 2016: 21-22).

[TABLE 2 AND FIGURE 7 AROUND HERE]

The evidence presented in Santos et al. (2016b) suggests that the positive terms of trade shock may also have played a role in stimulating investment. The Brazilian terms of trade are highly correlated with commodities prices' indexes and reflected the boom in the latter, between 2004 and 2011. There is, however, more than one plausible mechanism that could explain this effect of terms of trade on investment (Carvalho and Rugitsky, 2015: 10-12). It could be an effect of a positive demand shock to sectors that are responsible for a large share of investment; the data from Miguez (2016) seems to point in that direction.<sup>15</sup> Alternatively, given the high correlation between GDP and terms of trade in Brazil, the impact of the latter on investment could simply be capturing demand-induced investment in general.

These four elements can, thus, be plausibly represented as positive demand shocks, that is, as an outward shift of the effective demand schedule (from ED to ED', in Figure 3b).<sup>16</sup> The impact of falling wage inequality has been examined by Carvalho and Rezai (2016), whereas the positive impact of rising public investment and terms of trade in private investment could be formally incorporated, to keep things simple, as a positive shock in autonomous investment in the usual Kaleckian framework.<sup>17</sup> The impact of

<sup>13</sup> Rising household borrowing was not an exclusively Brazilian phenomenon, in the period, according to dos Santos (2012), who interpret it as a result of the changing strategies of financial firms coupled with supportive policies, which were, in their turn, promoted by multilateral institutions.

<sup>14</sup> Between 2005 and 2011, Petrobras' investments represented usually more than 80 percent of total investment by state enterprises, according to Orair (2015b: 122, table 1).

<sup>15</sup> C. H. dos Santos called my attention to this issue.

<sup>16</sup> Potential changes of the slope of the schedule are being disregarded, but would be an interesting issue to pursue in future research.

<sup>17</sup> Given that the government's primary surplus remained stable from 1999 until 2011 (with the exception of 2009 and 2010, when countercyclical policies reduced it), as show by Gobetti and Orair (2015), it might be justifiable not to incorporate government's expenditures explicitly in the argument, although an impulse along the lines of the balanced-budget multiplier

rising household borrowing, however, is not as easy to incorporate formally. The analysis of the conditions under which it results in an outward shift of the effective demand schedule can be found in an appendix (available upon request).<sup>18</sup>

Potential shifts in the distributive schedule are harder to identify, given that there were no significant changes in labor legislation in the period under consideration (Hall, 2009), beyond an increase in the legal recognition of the trade union confederations (*centrais sindicais*), approved in 2007, and the mentioned acceleration of the rate of growth of the minimum wage (a legal rule disciplining the annual raises was established in 2011 and renewed in 2015). The increase in the social transfers, first and foremost the *Bolsa Família*, was probably the most important measure to increase the bargaining power of the workers, by raising the recipients' reserve wage, that is, the lowest wage they require to accept a job. Elites' complaints about the program, which allegedly raised indolence and made it harder to find workers to hire, is a clear testimony of this effect. With a substantial share of workers outside the formal labor market and being paid less than the minimum wage, one could think that raising it faster would not have much impact. However, the growth acceleration observed in the period was accompanied by a process of labor market formalization that made the minimum wage more relevant (Medeiros, 2015: 79-108). In addition, the minimum wage also impacts the level of pensions and other transfers received by millions of families, with a poverty-reducing role that could also affect the reserve wage of members of recipients' families (even if the pensioner itself is outside the labor market). Hence, social transfers and rising minimum wage can plausibly be represented as a shift upwards of the distributive schedule: for any level of the degree of capacity utilization, a higher bargaining power implies a larger wage share.

The change in the sectoral job structure, which will be further examined in the next section, likely affected the slope of the distributive schedule. By augmenting the share of workers in sectors with lower labor productivity, the growth pattern of the period had two effects on the distributive schedule. On the one hand, it increased the employment elasticity of growth, that is, the number of jobs created by an increase of GDP, and consequently it accelerates the tightening of the labor market.<sup>19</sup> On the other, it tends to push down average labor productivity, by a composition effect. Both effects make the distributive schedule steeper, because, by pushing real wages up and labor productivity down, they strengthen the positive impact of the degree of capacity utilization on the wage share of income.<sup>20</sup> This change of slope together with the shift upwards mentioned above can be graphically represented as a dislocation from DC to DC', in figure 3b, above.

The shocks examined, affecting both schedules, changed the equilibrium from  $(u^*, \psi^*)$  to  $(u^*, \psi^*)$ , where  $u^* > u^*$  and  $\psi^* > \psi^*$ . The observed parallel increases of the degree of capacity utilization and of the wage share of income, from 2004 to 2008, can be interpreted as the movement towards the new equilibrium. The remaining question, then, is how to interpret the trajectory since the crisis. The years between 2010 and 2012, when the wage share of income kept growing and the degree of

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(Haavelmo, 1945) could have taken place (see Serrano and Summa, 2016: 819-820). What has been more significant in the period, however, was the change in composition of government's expenditures with the mentioned increase in public investment and in social transfers and a corresponding decline in interest payments. Such change of composition tends to be expansionary, due to heterogeneous multipliers (Pires, 2014, Orair, Siqueira and Gobetti, 2016).

<sup>18</sup> A comment is due on the trajectory of the exchange rate, given that it appreciated almost continuously between 2004 and 2011. Whether such an appreciation is contractionary or expansionary is a controversial issue (Krugman and Taylor, 1978, Razmi, 2007; see also Bresser-Pereira and Rugitsky, 2017, for a broader discussion of exchange-rate policy). Its negative impact on competitiveness suggests a negative demand pressure through net exports, while its positive impact on the real wage indicates a positive impact on consumption. In the Brazilian context, given low price-elasticities of exports and imports (Schettini, Squeff and Gouvêa, 2012, Santos et al., 2015), at least in the short run, it might be reasonable to assume that its short-run expansionary effect predominates. Evidence of a positive effect of exchange-rate appreciation on investment (Santos et al., 2016b) gives further confidence on this assumption.

<sup>19</sup> Palma (2012: 22-24) identifies high employment elasticity and low productivity growth as broader Latin American phenomena. Recent research by McMillan, Rodrik and Verduzco-Gallo (2014) suggests that they might result from sectoral dynamics.

<sup>20</sup> If this implies that, due to the change of the job structure,  $\hat{w}_u$  rises to  $\hat{w}_u'$  and  $\hat{x}_u$  falls to  $\hat{x}_u'$ , then the resulting slope of the distributive schedule will be steeper than the previous one:  $\frac{d\psi}{du} = \frac{\hat{x}_u' - \hat{w}_u'}{\hat{w}_\psi - \hat{x}_\psi} > \frac{d\psi}{du} = \frac{\hat{x}_u - \hat{w}_u}{\hat{w}_\psi - \hat{x}_\psi}$ , given that  $\hat{w}_\psi - \hat{x}_\psi$  is assumed to be negative.

capacity utilization fell slowly, might also be interpreted as a movement towards equilibrium, assuming that the degree of capacity utilization had overshot its new equilibrium level in 2007 and 2008. But the available analyses of the period (Paula, Modenesi and Pires, 2015, Serrano and Summa, 2016) suggest that the factors that shifted the effective demand schedule in the preceding period were being reversed, gradually in the beginning and strongly afterwards.

Beginning with wage inequality, while some measures indicate that it kept falling after 2011 (Figure 4), the ratio of average to minimum wage remained practically stable after 2011 (Figure 5). This apparent deceleration of the fall of wage inequality deserves further investigation, to check if it really happened and, in case it did, to establish its determinants. Household borrowing, in its turn, went through a more clear change of trajectory. The ratio of household debt without mortgage loans to disposable income peak in 2011, as mentioned, and fell continuously thereafter. It had grown, on average, 10.4 percent between 2005 and 2011 and it fell an average 2.6 percent between 2012 and 2014 (or 4.4 percent, if one includes the last two years, in which the crisis accelerated the decline of this ratio). Serrano and Summa (2016: 816-819) examined such reversal in detail. They claim that it might have been provoked, in 2010 and 2011, by the macroprudential policies adopted by the Brazilian Central Bank (allegedly to avoid unsustainable increases of private debt) and by the interest rate hike that was meant to curb accelerating inflation. The former were gradually reversed and the interest rate resumed falling in the second semester of 2011, but this did not lead to a recovery of household borrowing, possibly due to the slower labor market formalization observed in the period (which had been decisive to spread the access to credit) and the high level of indebtedness that households had reached by that time (see also Paula, Modenesi and Pires, 2015: 423-424).

As Table 2 shows, public investment went from an average growth rate of 10.90 percent, between 2004 and 2011, to an average negative rate of 4.87, between 2012 and 2015. Its trajectory was, however, not linear. It contracted sharply (12.6 percent) in 2011, due in part to a policy of fiscal adjustment in the first year of Dilma Rousseff's government, then grew in 2012 (5.9 percent) and 2013 (7.0 percent) and resumed falling in 2014 (2.0 percent) and 2015 (30.4 percent). The impact of falling oil prices and of a huge corruption scandal on Petrobras' investment certainly contributed to this trajectory, as well as, since 2015, the shift of economic policy towards austerity. Last, terms of trade peaked in 2011, then fell on average 3.7 percent per year between 2012 and 2014 and collapsed 11.0 percent in 2015.

It can be noted that such reversal can be divided in two phases: a first and slow one, from 2011 to 2013, when some of these factors that stimulated demand in the preceding period were being reversed while others kept growing; and a second and fast one, from 2014 to 2015, when all of them pushed demand downwards (Table 3).<sup>21</sup> Graphically, this could be depicted as two shifts in the effective demand schedule – one small and one large – that changed the equilibrium and unleashed a movement of the economy towards it. In Figure 8, below, this is represented as a shift of ED' to ED'' and, then, to ED''', shifting equilibrium to  $(u^{**}, \psi^{**})$ . Data for the wage share of income is available only until 2014, when it had only began falling, but the degree of capacity utilization was in 2014 already below its level of 2004 (Figure 2, above) and it fell sharply in 2015 and 2016 to, respectively, 0.885 and 0.881.<sup>22</sup>

#### [TABLE 3 AND FIGURE 8 AROUND HERE]

This framework and the interpretative hypothesis presented suggest some conclusions about the recent Brazilian trajectory. If the assumptions are correct, the observed increase in the wage share of income was a combined result of the growth acceleration (of the dislocation of the economy on the distributive schedule), of the pattern of growth (which made the distributive schedule steeper), and of policies that increased the bargaining power of workers (which shifted upwards the distributive schedule).

<sup>21</sup> Given the ambiguity of the trajectory of wage inequality, which might have kept falling in this period (as suggested by the Gini) or may have stabilized (as indicated by the average wage/minimum wage ratio), it will not be considered in the following argument.

<sup>22</sup> The two phases defined above (2011-2013 and 2014-2015) do not fit well with the trajectory observed in Figure 2, where the degree of capacity utilization started to decrease faster in 2013. However, the disaggregated data from Bonelli (2016) shows that the capacity utilization of agriculture, industry and several services' sectors grew in 2013, falling only thereafter. The fall in the average degree of capacity utilization observed is, then, entirely due to the fall in what is classified as "other services" (including food and lodging, private health and education, services provided to firms, among other activities).



Growth acceleration, as captured by the increase in the degree of capacity utilization, in its turn, can be attributed to expansionary policies (*crédito consignado* and increase in public investment), to falling wage inequality, and to the expansionary effect of the terms of trade's boom, all of which shifted the effective demand schedule. And, interestingly, given that the economy is assumed to be profit-led, growth accelerated despite the countervailing force exerted by a rising wage share of income. The reversal and subsequent crisis could be interpreted as a cyclical movement (after a potential overshooting of capacity utilization) accentuated by contractionary policies and negative shocks to demand. Or, alternatively, it could be interpreted simply as result of the latter, if no overshooting is assumed.

What does this framework implies about the limits of the growth acceleration with falling inequality observed in Brazil? First, it seems clear that the policies behind falling wage inequality and rising household borrowing – mainly, rising social transfers, increasing the minimum wage, and institutional changes in the credit market like the creation of the *crédito consignado* – had, so to speak, decreasing returns. The fall in wage inequality appears to have decelerated and it is plausible that further reductions of inequality would require bolder measures, like making the tax system more progressive. One could argue that, absent the macroprudential policies and the interest rate hike of 2010 and 2011, household borrowing could have kept increasing. But that is questionable, given that it did not grow after those two factors were reversed and that its stagnation might have been caused by stagnating demand for credit (due to the level of indebtedness), rather than by restriction of its supply. It is true, however, that a lower difference between the interest rates and the growth rates of income may allow further expansion of household credit, but interest rates in Brazil seem particularly difficult to cut down. Another factor pushing demand up, the terms of trade's boom, cannot be controlled by domestic policy and became a contractionary force from 2012 onwards. Thus, the only remaining factor that increased aggregate demand, public investment, would have to bear alone the task of sustaining growth, which was previously shared with falling wage inequality, rising household borrowing, and increasing terms of trade. In order to provide a more detailed examination of the limits of the growth acceleration with falling inequality, however, one has to go beyond the present framework and take sectoral heterogeneity into consideration. This is the task of the next section.<sup>23</sup>

### **3. Bringing the productive structure in**

#### **3.1. Modified framework**

Most of the Kaleckian literature, as the framework used above, disregard sectoral heterogeneity, resorting to single-commodity models.<sup>24</sup> This is not a problem in itself, given that this literature could be focused on issues that are sufficiently independent from sectoral dynamics. Rugitsky (2016) argued, however, that sectoral heterogeneity could be a decisive mediation between demand and income distribution. A strand of Latin American structuralism that connects Furtado's (1965) stagnationism to models of social articulation and disarticulation (Taylor and Bacha, 1976, de Janvry and Sadoulet, 1983) makes that clear, because it has several affinities with the Kaleckian literature (in its development from Steindl's (1952/1976) work to contemporary models), but gives centrality to sectoral heterogeneity (see Rugitsky, 2016). It might be true that this mediation plays a decisive role only on peripheral countries, central economies being less structurally heterogeneous. But this only strengthens the case for multisectoral Kaleckian frameworks, if they are to be applied to peripheral economies like the Brazilian one.

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<sup>23</sup> This framework might also help to shed light on the dispute about the reasons why the economic policy shift implemented between 2011 and 2013, sometimes called the new macroeconomic matrix, failed to sustain growth and ended in a collapse (see, for instance, Bresser, 2014: 354-370, Singer, 2015, Rugitsky, 2015, and Serrano and Summa, 2016). On the one hand, such shift did have some contractionary aspects, especially the cut in public investment observed in 2011, which was meant as a necessary fiscal measure to allow for the relaxation of monetary policy, undertaken from August 2011 onwards. This cut was reversed in 2012 and 2013, but the growth rate of public investment never recovered to the level attained in the preceding period. On the other hand, considering the decrease of household debt and of the terms of trade that began in 2012 and the apparent deceleration of the fall of wage inequality, some policy shift was needed to sustain the previous rates of growth. The one chosen was ill suited for the purpose, as private investment demand did not respond to falling interest rates and a rising exchange rate due to insufficient demand and stagnant world trade. But pursuing the previous policies was no longer a viable strategy.

<sup>24</sup> Notable exceptions can be found in Taylor (1983, 1989) and Dutt (1990).

Sectoral heterogeneity is not merely an additional variable that can be incorporated in the framework of the previous section. Rather, once accounted for, it often brings along cumulative processes, as the one suggested by Figure 9, below.<sup>25</sup> Income distribution, in addition to its impact on effective demand, may have an impact on demand composition, if the consumption baskets of households from different income groups differ significantly. In this way, a change in income distribution – a reduction of wage inequality, for instance – changes the aggregate composition of demand, which tends to affect relative prices and, consequently, the productive structure itself. The sectors producing the goods whose relative share of aggregate demand has risen tend to grow faster than the economy as a whole. If, moreover, different sectors require different combinations of skill, the change in the productive structure will impact the job structure regarding the relative shares of skilled and unskilled workers.<sup>26</sup> Finally, such change in the job structure will inevitably feedback into the distribution of wages, either increasing or decreasing wage inequality. If wage inequality is further decreased, it is easy to see that a cumulative process will be unleashed, restarting the cycle. To borrow Myrdal's (1957) concept, this would consist in a circular and cumulative causation involving income distribution and the productive structure.<sup>27</sup>

*[FIGURE 9 AROUND HERE]*

Concretely, this cumulative process would entail that, in Figure 3b above, once a fall in wage inequality shifted the effective demand schedule outwards (from ED to ED'), its impact in the productive structure would lead to further reductions of wage inequality, pushing the schedule further. Its dislocation would go on indefinitely – or, at least, until the economy reached full utilization of capacity.<sup>28</sup> Alternatively, if one disregards labor heterogeneity and assumes a cumulative process between the productive structure and the functional income distribution, as Taylor (1989) does, any shift of the wage share (due, for instance to a shift of the effective demand schedule) would unleash the cumulative process and that would shift the distributive schedule continuously upwards. In addition, incorporating sectoral heterogeneity into the framework would likely impact the slope of the effective demand schedule, given that aggregate investment may be influenced by the changes in the productive structure. As in Taylor's (1989) formulation, different sectoral responses of investment to the sectoral profit rates could make a change in the income distribution, through its impact on the composition of demand and, thus, on the productive structure, be either a stimulus or a hindrance to aggregate investment. In this way, income distribution would affect investment not only through the profit share of income and the degree of capacity utilization, as in the single-commodity framework above, but also through the change in the productive structure.

The slope of the distributive schedule could also be impacted by sectoral heterogeneity, with the eventual cumulative process probably generating instability in the relation between demand and distribution. As may be clear by now, fully examining the implications of incorporating sectoral heterogeneity would demand a new model, with at least two sectors, one that could build on Taylor's (1989) formulation. That lies, however, beyond the scope of the present paper. The aim in the next subsection will be restricted to suggesting, in light of some sectoral data, the plausibility of identifying the mentioned cumulative process as one of the determinants of the recent Brazilian trajectory. It is hoped

<sup>25</sup> A similar examination of structural transformation can be found in Medeiros (2015: 57-59, 110-112), who follows the work of Maria da Conceição Tavares – an important reference for the present work as well.

<sup>26</sup> This distinction between skilled and unskilled workers is common among economists, but it is more likely that wage inequality is predominantly determined not by the differences between individuals, but by differences between jobs. In this sense, the cumulative process would operate through changes in the occupational structure, that is, in the shares of high-wage and low-wage jobs, independently of the level of skill of the workforce. See, for an analysis of the occupational structure's role in Brazilian inequality, Carvalhaes et al. (2014).

<sup>27</sup> The cycle described is only one possibility among many. Taylor's (1989) two-sector Kaleckian model is, for instance, a slightly different one, in which the cycle would be started by a change in the functional distribution of income. Then, the change in the productive structure, resulting from the change in demand composition, would directly feedback into the functional distribution of income, because he assumes that the sectors have different capital/labor ratios. In other words, labor is assumed to be homogeneous and, as a result, the cumulative structural transformation has one stage less.

<sup>28</sup> Another possibility is that the dislocation would be halted once the profit share was squeezed to a level considered to be too low. The linear representation of the schedule might suggest, misleadingly, that it could be squeezed to zero, with all income being wage income. But that is, of course, not realistic.

that this interpretative hypothesis, which goes beyond the one presented in the previous section, serves as a stimulus to further research on the interactions between demand, distribution, and the productive structure in the Brazilian economy.

### 3.2. Brazil's economic antimiracle

In general terms, the following cumulative process seems to describe well an aspect of the recent trajectory of the Brazilian economy.<sup>29</sup> The decline in wage inequality as well as the rise in the wage share of income, results (as mentioned above) of the rise of the minimum wage, of increasing social transfers, of the pattern of growth and of its acceleration, led to changes in the composition of aggregate demand, due to the diffusion of consumption habits previously restricted to richer groups to those in the bottom of income distribution. At least part of this change in the composition of demand was, then, reflected in changes in the productive structure, while part of it was met through imports (Medeiros, 2015: 115-126). Notably, the rise of services as a share of total value added as well as the decline in manufacturing seem, at least in part, to be attributable to that. The change in the productive structure, in its turn, led to a transformation of the job structure, with a growing share of low-productivity jobs. Such transformation, finally, deepened the decline in wage inequality, restarting the cycle.<sup>30</sup>

The contrast of this process with the one observed during the so-called Brazilian “economic miracle”, the growth spurt that took place during the military dictatorship from 1968 to 1973, is too obvious to be ignored (see, for instance, Medeiros, 2015: 67, fn. 31). Then, the shift of the income distribution took place in the opposite direction, that is, towards greater inequality, stimulating the mentioned controversy on income distribution in the 1970s (Langoni, 1973/2005, Tolipan and Tinelli, 1975, Bacha and Taylor, 1978). The most plausible conclusion of this controversy is that growing inequality was a result, especially, of wage policy and of violent repression of labor militancy and union activity. Rising inequality led, in its turn, to a change in the pattern of demand towards what were then luxury goods, mainly cars and electric appliances, the consumption of which seemed to be still concentrated on the top groups of the income distribution.<sup>31</sup> Such change in the composition of aggregate demand affected the productive structure, stimulating the relative growth of the industries that were then called dynamic and that were intensive in capital and relatively more skilled labor. As expected, the change in the productive structure was felt in the job structure, reinforcing the rise in wage inequality (and, through the change in the average capital/labor ratio, the change in the productive structure accentuated the rise in the profit share – see Marquetti, Maldonado Filho and Lautert, 2010, for evidence of this increase). The cycle was, thus, restarted by growing inequality.<sup>32</sup> If the “miracle,” then, consisted in a cumulative process in which rising inequality and changes in the productive structure reinforced each other, a process in which falling inequality and changes in the productive structure reinforced each other may be called an economic antimiracle. In order to examine such interpretative hypothesis in more detail, some data on the recent changes in the consumption pattern, the productive structure, and the job structure need to be analyzed.

The few studies available that examine consumption with disaggregated data for the period under consideration are those that resort to household budget surveys available for 2002-2003 and 2008-2009 (Medeiros, 2015: 51-78, Carvalho et al., 2016; see also Brunelli, 2015, and Kerstenetzky, 2016). As mentioned, Medeiros (2015: 70, table 3) identifies a shift of aggregate consumption away from food and

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<sup>29</sup> For a similar description, see Medeiros (2015: 130).

<sup>30</sup> Independently of the impact of the changing productive structure on the job structure, the former may have led directly to changes in the functional distribution of income, due to heterogeneous sectoral wage shares of income. Dias and Ruiz (2016) find that more than 40 percent of the increase in the wage share observed between 2005 and 2009 can be explained by a sectoral composition effect. This connection between the productive structure and the functional distribution of income may result in a cumulative process like the one suggested by Taylor (1989). In theory, the combination of both processes (with or without labor heterogeneity) may result in a stronger cumulative transformation.

<sup>31</sup> Wells (1977) provided a critical examination of that hypothesis, suggesting that it was true, then, only for cars, but not for other durables, like electric appliances.

<sup>32</sup> For analysis of the “economic miracle” along those lines, see Tavares and Serra (1971/1976) and de Janvry and Sadoulet (1983). Interestingly, the models that attempted to examine the interaction between demand, distribution, and the productive structure were largely formulated as an attempt to interpret the “economic miracle,” both in the tradition of Latin American structuralism (Taylor and Bacha, 1976, de Janvry and Sadoulet, 1983) and in the Kaleckian one (Taylor, 1989).

clothing and towards housing, transportation, health, hygiene, personal care, and personal services. The first group represented, in 2008-2009, about a quarter of aggregate consumption, its share having fallen 1.2 percentage points since 2002-2003. The second group, in its turn, accounted for about 2/3 of aggregate consumption in 2008-2009 and its share increased 2.6 percentage points. This reflects, according to Medeiros (2015: 51-78), a process of diffusion of consumption habits beyond basic necessities and it is certainly related to both rising aggregate income and declining inequality – it is in part an evidence of Engel’s law.<sup>33</sup> In addition, the faster rates of growth of income of the relative poorer seems to explain the other shift observed in the consumption pattern: the share in aggregate consumption of education, leisure, culture, and smoking, the consumption of which is mostly done by the richer households<sup>34</sup>, fell from 7.2 to 5.5 percent between 2002-2003 and 2008-2009 (Medeiros, 2015: 70, table 3). There is, thus, strong evidence about the impact of falling inequality on the composition of demand.

Next, the impact of the changing pattern of consumption on the productive structure needs to be examined. The main challenge, in this regard, is that there is no simple way to map the categories of consumption, from the household budget surveys, to the classification of production activities used in national accounts. Production activities include both the production of final products and services, destined for household consumption, as well as the production of products and services that are used as inputs in other activities. So a change in the patterns of consumption represented, for instance, by the increase in the share of consumption of health-related goods and services may impact not only the production activity named “private health” (a service), but also the industrial activity called “pharmaceutical products” and possibly several other activities that provide inputs for the above mentioned ones (maybe “chemical products,” “rubber and plastic goods,” etc.). In addition, households consume national products and services as well as imported ones, with the result that changes in the composition of demand may not impact the productive structure, if it is based mainly on imports. It can also be true that a change in the productive structure is mainly attributable to changes in foreign demand, with a stable domestic pattern of consumption.

Bearing these caveats in mind, an examination of the changing shares in value added of groups of activities might provide some clues about the interaction between the pattern of consumption and the productive structure. The first noteworthy fact that can be observed in Table 4<sup>35</sup>, is that the changing shares of agriculture, industry, and services in the period between 2004 and 2011 mostly reverted the change, in the other direction, that took place between 2000 and 2004. The shares of agriculture and industry fell around 1.5 percentage points between 2004 and 2011, returning in 2011 to a level similar to the one observed in 2000. In terms of the productive structure, the subsequent period, from 2011 to 2014, that were called “reversal” above, due to the fall of commodity prices and the deceleration of growth, is not a reversal: most trends observed from 2004 to 2011 were deepened in it. As a result, from 2004 to 2014, agriculture lost 1.65 percentage points of its share of value added, industry lost 4.84 and services compensatingly gained 6.49. What can be observed, in this very aggregated manner, are both indications of the deindustrialization often discussed in the period and of the rise of services’ activities, which may reflect the changing pattern of demand discussed above.<sup>36</sup>

The trajectory within industry’s and services’ groups of activities were heterogeneous, however. Most of the fall of the share of industry is accounted by a fall in manufacturing, whereas both extractive industries and construction grew markedly between 2004 and 2011 and fell slightly from then on, with a

<sup>33</sup> Data from Carvalho et al. (2016: 23-24, table 7) indicates, for instance, that food (both *in natura* and processed) accounted for 14.46 percent of total consumption of the three poorest out of six income groups, in 2002-2003, but represented only 10.89 percent in 2008-2009. For the three richest groups, however, this share fell less, from 7.57 in 2002-2003 to 6.14 in 2008-2009. The six groups are defined by income levels and not by the number of people. The three poorest groups comprised, in 2002-2003, around 63 percent of households and, in 2008-2009, around 54 percent.

<sup>34</sup> Almost 2/3 of total expenditures on occasional travels and on higher education, for example, are done by the top 20 percent richest households (Medeiros, 2015: 73, table 4).

<sup>35</sup> Due to space constraints, Tables 4 and 5 are not included in the paper, but can be provided by the author upon request.

<sup>36</sup> On the debate whether Brazil experienced or not a “premature deindustrialization,” see Squeff (2012) and the references mentioned therein. See also Rodrik (2016).

net increase in their share in the whole period (Table 4).<sup>37</sup> The trajectory of the extractive industries (especially, oil, gas and iron ore, which account for most of them) is certainly related to the commodity boom. Construction, in its turn, might have grown along with public investment, having fallen with its stagnation since 2011, but the trajectory of privately-provided residential housing might also have impacted the observed result. Within manufacturing, it is noteworthy that textile-related activities (including textiles, clothing and accessories, and leather artifacts and shoes) contracted in the period, something that may be related to the decreasing share of clothing in aggregate consumption, but also to the growing penetration of imports from Asia.<sup>38</sup> Regarding services, it can be seen that its growth is accounted by the growth of trade, transportation, storage, postal services, and other services (comprising food and lodging, private health and education, services provided to firms, among other activities), while information services, finance, insurance, and real estate saw their share of value added contract (Table 4). This reinforces the suspicion that it is a phenomenon related to the changing pattern of consumption that resulted from falling inequality, inasmuch as the growth seems to have been concentrated on low-productivity services focused predominantly on providing for groups on the bottom of the distribution: the rise in trade, for instance, may be in part a result of the incorporation in the mass consumption market of groups previously excluded from it.<sup>39,40</sup>

In order to assess the changes in the job structure, one might begin with Table 5. Industry saw its share of total employment grow 2.48 percentage points between 2004 and 2014, despite its falling share of value added (Table 4). In addition, agriculture's share of employment fell much more than its share of value added (6.94 and 1.65, respectively), an indication of labor productivity growth. Similarly, services' share of employment grew less than its share of value added: respectively 4.46 and 6.49 percentage points. Changes within industry's and services' groups of activities are less pronounced here than in their share of value added, with construction and other services being the two groups whose share of employment grew more markedly.<sup>41</sup> Despite these differences, the relation between the changes in the productive and the job structures, especially regarding the growth of services, seems clear.

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<sup>37</sup> The manufacturing activities that fell most, in the period, were oil refining and coke, chemical products, production of steel and related products, and cars, trucks, and buses. Further research is needed to interpret whether such fall can be accounted by changing relative prices, by changing pattern of demand or by other factors.

<sup>38</sup> However, food and beverage production increased its share slightly, in the period, despite the falling share of food in aggregate consumption. This may be a result of growing exports of processed primary products, like meat, possibly related to the commodity boom.

<sup>39</sup> The rise in services provided to firms is an exception, being related to a different dynamic. It might have been the result of outsourcing of activities previously done within industrial firms. Moreover, private education saw its share of value added diminish in period, in line with what the analysis of the composition of demand has shown, whereas private health contracted slightly until 2011 and grew quickly afterwards, with a net increase of its share in the whole period.

<sup>40</sup> Medeiros (2015: 109-132) provides a more detailed analysis of the interaction between the pattern of demand and the productive structure by examining together household budget surveys and input-output matrices for the period between 2003 and 2009. Despite recognizing that the growth of the services sector is in part a result of "structural and distributional transformations" (115), he seems to underplay the changes in the productive structure, emphasizing the powerful "inertia of the structure" (117). He argues that the aggregate consumption structure is rigid, despite the diffusion of consumption habits mentioned above, and that the change in such a structure that did happen were allowed for by changing imports, rather than by shifts in the domestic productive structure (see esp. 116-117, 122-126). The somewhat contrasting interpretations that can be made from the data he uses and from national accounts' data (Table 4) should be further investigated. It is possible that the comparison between 2003 and 2009, a restriction imposed by the availability of household budget surveys, biases his results, given that shares in value added of several activities reverted their trajectories in 2004 and that the change then started continued after 2009, at least until 2014, in several cases. The next household budget survey that should be made available next year may contribute to illuminate this issue. Medeiros' argument is made more puzzling by the fact that he repeatedly emphasizes the impact of the changing pattern of consumption on the job structure, but as suggested in Figure 9, above, this effect should take place through the productive structure. It is conceivable that the change in the job structure reflects shifts in the occupational structure within sectors, being then independent of changes in the productive structure. But such hypothesis would require a specific explanation.

<sup>41</sup> The growth of the share of employment of other services occurred despite the notable fall of the share of one of the activities included in it, domestic services. Such fall seems to be one of the most symbolic results of the combination of growth acceleration and falling inequality, given that Brazil has one of the largest shares of domestic workers in the world.

Further research is needed to examine more carefully such interaction and the impact of the change in the job structure on wage inequality.<sup>42</sup> But there seems to be enough evidence that the compression of wage disparity that took place is related to the growth of the share of jobs in the middle of the wage distribution, above the informal market and below the higher-paid jobs destined to relatively more skilled workers. Carvalhaes et al. (2014: esp. 88-93) focusing on the occupational distribution point in that direction, estimating that around 18 percent of the reduction of income inequality between 2002 and 2012 (measured as the variance of the logarithm of income) can be attributed to changes in the occupational structure. Such growth, in its turn, appears to be related to the growth of services and of the share of employment in construction, whereas the fall in agriculture employment may be related to declining informality and the relative stagnation of manufacturing employment might be related to the relative stagnation of higher-paid jobs.<sup>43</sup> All that occurred along with the acceleration of the rate of growth of the minimum wage, which seems to have increased the bargaining power of workers in the middle of the income distribution and, by increasing their income, reinforced the relative growth of jobs in services' activities that catered to them (Medeiros, 2015: 79-108).

All that evidence, regarding the connections between inequality, demand composition, productive structure, job structure, and (again) inequality, provide plausibility to the hypothesis according to which the recent Brazilian trajectory might be in part interpreted as a cumulative structural transformation, as the one represented in Figure 9. Lacking a fully worked-out model, it is not possible to identify precisely the implications of such cumulative transformation for the growth acceleration observed in the period. But, if one accepts, as suggested above, that this cumulative transformation could be represented graphically as a continuous shift outwards of the effective demand schedule and also as a continuous shift upwards of the distributive schedule, it is clear that it would lead to a shift of the equilibrium that would push the wage share up. Its impact on demand, however, is ambiguous, depending on how much each schedule is dislocated. To account for the observed parallel increases of the wage share and of the degree of capacity utilization, it would need to be assumed that the shift of the effective demand schedule would predominate over the shift of the distributive one.

This hypothesis may also have implications for the limits of the combination of growth acceleration with falling inequality. First, the impact of the cumulative transformation on services' share of value added could be related to the accelerating services' inflation observed in the period, resulting for instance from Baumol's cost disease (Santos et al., 2016a, offer a detailed analysis of services' inflation and attempt to relate it to Baumol's argument; see also Brunelli, 2015). This was only made compatible with inflation targeting, adopted in Brazil since 1999, with the aid of a continuous appreciation of the exchange rate, which pushed several products' inflation down and helped maintain the average inflation around its target (which is 4.5 percent since 2005). Once international liquidity and domestic policy started to push the currency towards depreciation, in mid-2011, inflation started to accelerate. Such dependence of the cumulative transformation on exchange rate appreciation to compensate services' inflation tends to reinforce, in its turn, the change in the productive structure, given that shifting relative prices negatively impact tradable goods and services (especially, manufacturing). This change in the productive structure, as a result of changing demand composition and of currency appreciation, may impose two limits to the growth acceleration. The first is a fiscal one: the fall of the share of industry in value added may push tax revenues downwards, given the high dependence of the Brazilian tax system on the taxation of goods and the difficulties of taxing services. This could eventually limit the capacity of the

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<sup>42</sup> Some available research along these lines include Pauli, Nakabashi, and Sampaio (2012), Carvalhaes et al. (2014), and Soares (2015).

<sup>43</sup> Lustig, Lopez-Calva, and Ortiz-Juarez (2013: esp. 137-138) report findings that indicate that the decline in the skill premium observed in the 2000s in Argentina, Brazil, and Mexico may have been caused by a decline or deceleration in the demand for skilled labor, which in its turn might be a result of changing "composition of output and employment" (138). They point, however, to some research that suggest that the latter may have been caused by changes in terms of trade, instead of by the changing composition of demand. Their inconclusive results on the role of the terms of trade (which seem to be related to the falling skill premium, but not to the changing skill composition of employment) could be explained, though, by not taking into account its interaction with a changing demand pattern.

government to keep increasing public investment, which seems to have been, as noted, an important determinant of growth acceleration.<sup>44</sup>

The second limit is related to growth's external constraint.<sup>45</sup> It is plausible that the changing productive structure observed increased the income-elasticity of imports and decreased the income-elasticity of exports, given the growing concentration of the export basket on commodities (which tend to have below average income-elasticity) and the growing dependence on imports to cater for the changing demand composition. According to the Thirlwall's (1979) formulation, the rate of growth that is compatible with balance of payments equilibrium is determined precisely by these income elasticities and the potential change observed in Brazil would have pushed the "equilibrium" rate of growth down.<sup>46</sup> Thus, even though the commodity boom relaxed temporarily the foreign constraint on growth, the underlying change in the productive structure (a result of the cumulative transformation, of currency appreciation, and of the commodity boom itself) tended to alter the income elasticities of foreign trade, so that the growth of rate would be limited, by the equilibrium of the balance of payments, at a lower level than before. Once the commodity boom ended, such constraint would come to the fore, as the deterioration of the current account showed.

The discussion of these limits allows one to examine the policy shift that occurred in 2011 once more. The attempt to maintain the exchange rate at a higher level (that is, more depreciated) could be understood as a measure to stimulate industrial production and, in this way, counteract the change in the productive structure that made the foreign constraint more binding and that tended to accelerate inflation. One could argue that its effect, however, would only be felt after some time, since changes in relative prices are not able to impact the productive structure immediately, and in the short run the currency depreciation tends to be contractionary. But the hypothesis about the cumulative transformation suggests that there were deeper limits to the success of such policy shift, inasmuch as it attempted to revert a change in the productive structure that was part and parcel of a cumulative process that not only would hardly be halted by currency depreciation alone, but also was further stimulated by other policies that were inherited from the previous period (the increases in the minimum wage and the growing social transfers, for instance).

#### **4. Concluding remarks**

The preliminary nature of the hypotheses formulated in the present paper has to be emphasized as a stimulus to further engagement with the questions raised in the current research. Efforts to formalize Kaleckian models that incorporate sectoral heterogeneity and that can result in cumulative structural transformations, as suggested in section 4.1, above, are one of the avenues for future research – research that can build on Taylor (1989) and Dutt (1990: chaps. 6 and 7). This may allow more precise examinations about the way in which incorporating sectoral heterogeneity can modify Kaleckian single-good models. In addition, the examination of how actual data fit the theoretical predictions of the models might be pursued, for example, by calibrating the parameters of some version of the framework presented in section 3.1 and simulating the shocks in wage inequality, household borrowing, public investment, and terms of trade. Moreover, whereas the impacts of such variables on aggregate demand and income distribution have been investigated empirically, the interaction between inequality, demand composition, productive structure, and job structure deserves much further investigation.<sup>47</sup> It is hoped that the hypotheses presented here help in some way formulating such questions for future research.

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<sup>44</sup> This limit may not be relevant in practice, inasmuch as the cumulative transformation is also related to the increase in labor market formalization, which, in its turn, tend to push tax revenues up. See Orair (2015a).

<sup>45</sup> A similar interpretation can be found in Medeiros (2015: 22, 43, 147).

<sup>46</sup> On the so-called "Thirlwall's law," see also McCombie and Thirlwall (2004) and Thirlwall (2011). Resorting to this framework, but making the income elasticities endogenous to the level of the exchange rate, Ferrari, Freitas, and Barbosa Filho (2013) examine the possibility that a continuously overvalued exchange rate may reduce the "equilibrium" growth rate, a possibility that may be relevant to the recent trajectory of the Brazilian economy.

<sup>47</sup> It also has to be mentioned that the present paper restricted its purview to strictly economic issues, but it is evident from the recent crises in South America that the determinants of the trajectory observed during the commodity boom as well as of its limits should be sought for in the interpenetration of economic and sociopolitical dynamics. Such interdisciplinary research seems indeed to be crucial.

A final question regards the lessons suggested by the interpretation provided for the recent Brazilian trajectory. They indicate that there is no simple way to combine high growth and falling inequality. The limits of the recent brief attempt to do so point to inherent difficulties as well as to need to resort to more structural answers to high inequality (like making the tax system more progressive). Maintaining high levels of public investment in selected physical and social infrastructure that is compatible with environment preservation could also prove to be an effective way to raise productivity and competitiveness and to attenuate distributive conflicts. The main lesson may be, however, that any policy strategy has to take into consideration its potentially cumulative impacts on the productive structure, if it aims at sustaining growth in peripheral countries that tend to be subject to foreign constraints.

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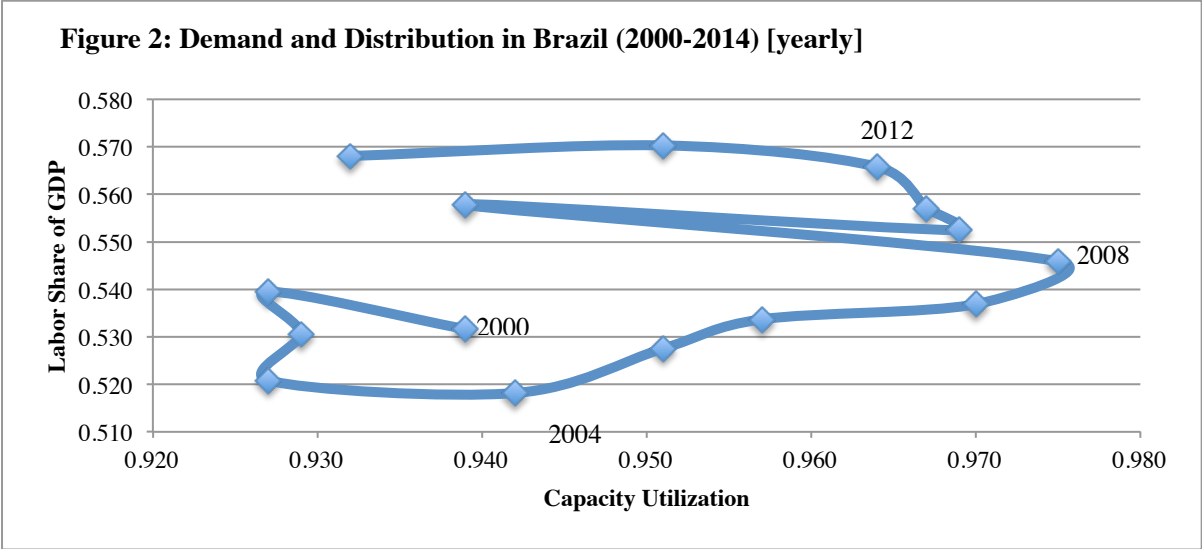
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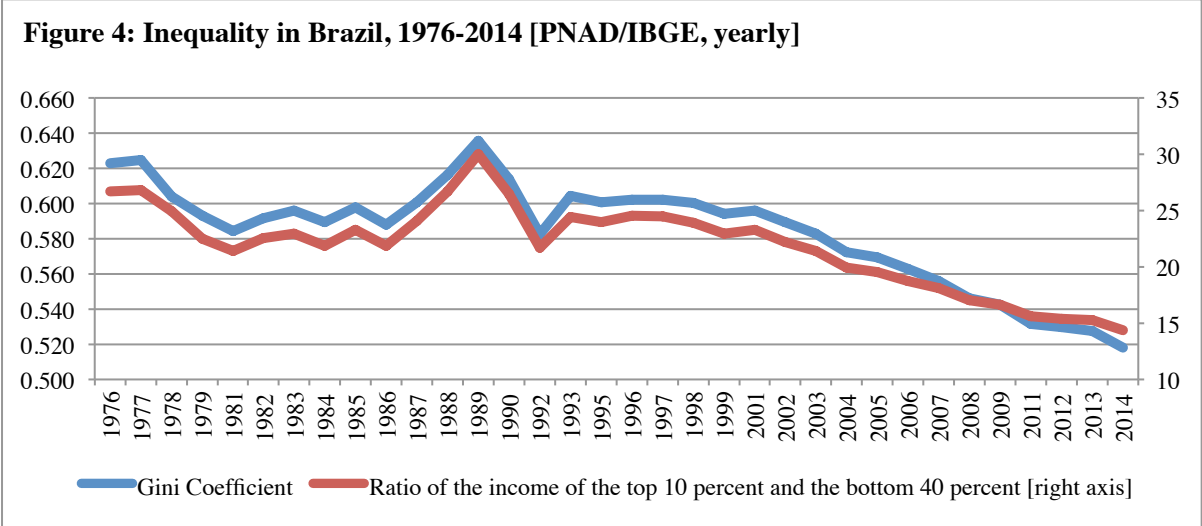
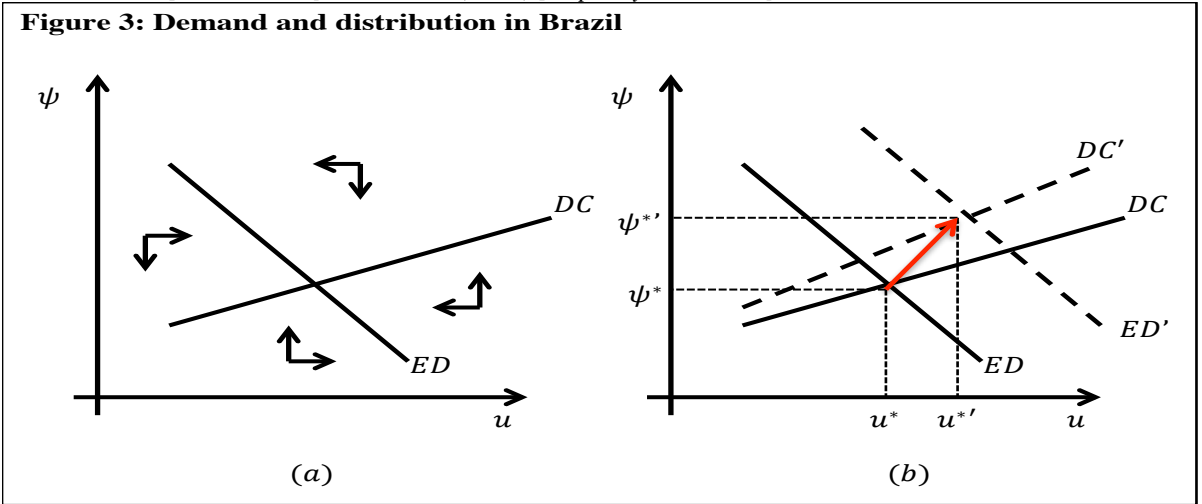
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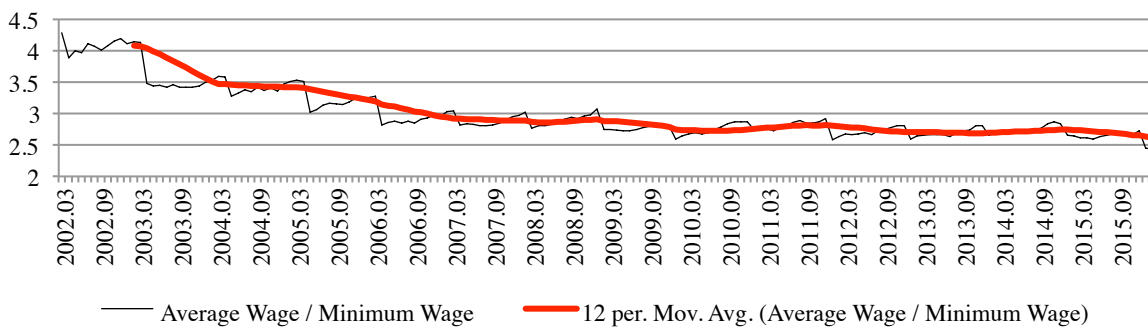
APPENDIX 1: FIGURES



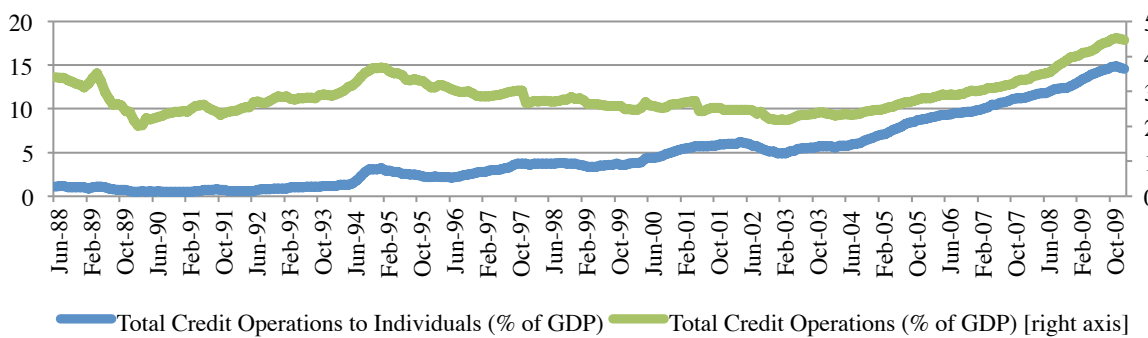
Sources: IBGE [Labor Share] and Bonelli (2016) [Capacity Utilization]



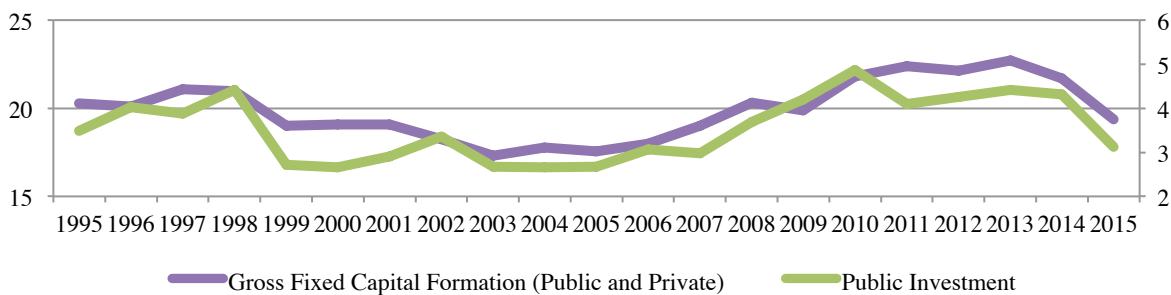
**Figure 5: Inequality in Brazil, 2002-2016 [PME/IBGE, monthly]**



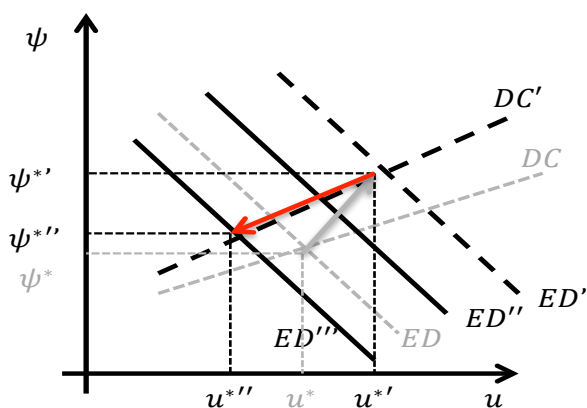
**Figure 6: Household Borrowing in Brazil, 1988-2010 [BCB, monthly, percent of GDP]**



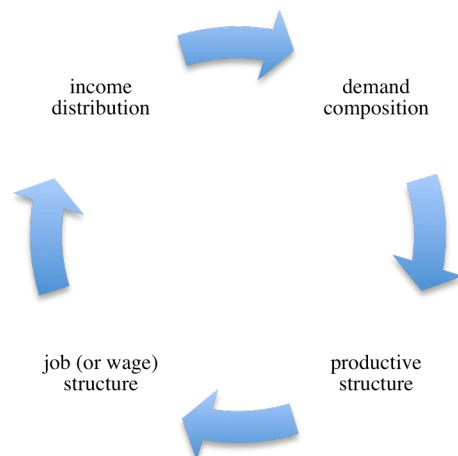
**Figure 7: Investment in Brazil, 1995-2015 [yearly, share of GDP]**



**Figure 8: Demand and distribution in Brazil**



**Figure 9: Cumulative Structural Transformation**



## APPENDIX 2: TABLES

<b>Table 1: Real GDP Growth Rates in Selected South American Countries [yearly average]</b>				
	Debt Crises	Neoliberalism	Commodity Boom	Reversal
	1980-1989	1990-2003	2004-2011	2012-2015
Argentina	-0.73	2.71	6.21	0.27
Bolivia	-0.24	3.52	4.60	5.56
Brazil	3.02	1.88	4.43	0.41
Ecuador	2.37	2.65	4.80	3.54
Uruguay	1.24	1.48	5.94	3.10
Venezuela	0.20	1.11	6.50	-0.79
Selected South American countries*	0.98	2.23	5.41	2.02
World	3.15	3.13	3.95	2.97

Sources: World Bank (Argentina), IBGE (Brazil) and IMF (other countries and world data)

\* Unweighted average of the rates of growth of the six countries above

<b>Table 2: Real Growth Rates of Investment [yearly average]</b>				
	Debt Crises	Neoliberalism	Commodity Boom	Reversal
	1980-1989	1990-2003	2004-2011	2012-2015
All Governments (city, state and federal) [A]	2.35	1.43	11.22	-3.50
State Enterprises [B]	-6.21	-0.07	11.24	-5.77
Public Investment [A+B]	-3.00	-0.48	10.90	-4.87
Gross Fixed Capital Formation	0.42	0.49	7.97	-3.00

Source: Orair (2016)

<b>Table 3: Growth acceleration and reversal in Brazil (2004-2016) [rates of change]</b>								
	Commodity Boom	Reversal	Slow Reversal			Fast Reversal		
	2004-2011	2012-2015	2011	2012	2013	2014	2015	2016
Household Debt*	10.4	-3.3	4.1	-0.1	-2.7	-4.9	-5.7	-9.1
Public Investment	10.9	-4.9	-12.6	5.9	7.0	-2.0	-30.4	
Terms of Trade	4.3	-5.6	7.9	-5.8	-2.1	-3.4	-11.0	3.1
Capacity Utilization	0.5	-2.2	-0.2	-0.3	-1.3	-2.0	-5.0	-3.8

Sources: BCB, Orair (2016), Funcex, Bonelli (2016)

\* Excluding mortgage loans, as a share of disposable income (data available only from 2005)