Unsustainability in wage-led growth regimes: The case of the Brazilian economy in the 2000s

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Abstract

This paper 'relax' some assumptions of the seminal Bhaduri and Marglin's (1990) analysis, allowing distribution to be endogenously determined in function of expectations concerning, not only demand levels but, also and especially, concerning firm's creditworthiness. This permits us to conclude that wage-led growth paths tend to be constrained by the evolution of the financial structure that had previously made feasible the distribution trajectory itself. We conclude the paper arguing that our theoretical hypotheses a suitable framework to explain the recent Brazilian economic performance. Since mid-2000s, the country has been presenting an unprecedented upward trend of the wage-share that, in a first moment, seems to be part of a well-succeeded strategy to grow via distribution. In a second moment however, from early 2010s to nowadays, the Brazilian economy has not shown the accelerated growth observed in previous years, which indicates the deterioration of the wage-led strategy.

Keywords: wage-led growth regime, finance structure, credit cycle reversal.

JEL: E12, E25, E44.

Resumo

Este trabalho 'relaxa' alguns pressupostos da análise seminal de Bhaduri e Marglin (1990) e considera que a distribuição é endogenente determinada em função das expectativas a respeito, não só dos níveis de demanda, mas particularmente acerca da solvabilidade das firmas. Desta forma, foi possível concluir que as trajetórias de crescimento do tipo *wage-led* tendem a ser constrangidas por uma evolução da estrutura de financiamento que outrora viabilizou a própria trajetória distributiva. Ao analisar indicadores do desempenho econômico brasileiro recente, conclui-se que as hipóteses teóricas construídas neste trabalho oferecem um bom *framework* para explicá-lo. Desde meados dos anos 2000 o país vem apresentando um aumento sem precedentes na participação dos salários na renda, que em um primeiro pareceu ser parte de uma bem-sucedida estratégia de crescimento via distribuição. Em um segundo momento, entretanto, do início dos anos 2010 até hoje, a economia brasileira não tem apresentado o crescimento acelerado dos anos anteriores, indicando a deterioração da estratégia *wage-led*.

Palavras-chave: regime de crescimento *wage-led*; estrutura de financiamento; reversão do ciclo de crédito.

1. Introduction

This paper examines the recent Brazilian growth and distribution paths from the perspective of the post-Kaleckian background (Bhaduri and Marglin, 1990) and taking in account aspects of the Minskyan theory. Constructing a theoretical scheme that exposes the intrinsic unsustainability of the finance structure in a growing wage-led economy, we are able to show how, after early 2010s, indicators related to credit supply, firm's indebtedness, and liquidity preference, among others, have jointly pointed to the collapse of the conditions that had sustained the well succeed Brazilian wage-led strategy of the 2000s.

In their seminal paper, Bhaduri and Marglin (1990) introduce the discussion concerning sustainability of the wage-led growth shedding light on the role played by the composition of the profit rate. According to the authors, the accumulation process, and so the growth path, could be constrained along a trajectory of rising wage-share if the reduction in average propensity to save induces an expected increase in the revenues not sufficient to surpass the negative impact of the reduction of profit margin over the expected profit rate. The present analysis goes a step ahead and, in order to discuss the sustainability of wage-led regimes, we explicitly associate the distributive path to the predicted reversion of the credit cycle in a Minskyan perspective.

Minsky (1986) described an intrinsically unstable economy given an endogenous pattern of change in expectations regarding the risk of insolvency. Broadly speaking, in the periods of activity expansion, the expectations of agents (borrowers and lenders) tend to corroborate increasingly leveraged positions. However, along the time, because of the deepening of indebtedness, there is a deterioration of the general confidence concerning the ability of firm to fulfill its financial obligations making use of profits to be generated in a future of fundamental uncertainty. The result is the reversal of the liquidity cycle with a contractionist impact on the real economy.

The analysis carried out in this paper allows the distribution be endogenous in the post-Kaleckian model and also takes in account the role of expectations, not only those concerning the demand variations, but especially the assessments regarding the solvability of firms. We demonstrate that, in a wage-led regime, with continuing reductions in the share of profits in national income, the increase of loan operations as a proportion of generated income is crucial to sustain the expected level of revenues, as well as to making possible the continuity of the redistribution itself. Such dynamics can end up undermining firm’s creditworthiness, which permit us to associate the distributive component in wage-led regimes to the credit cycle reversal – a variable acting together to the predicted

psychological tendency of economic agents to corroborate increasingly indebted positions during economic expansion.

Since mid-2000s, the wage-share has presenting an upward trend not ever observed in the recent Brazilian economic history. Until the early 2010s, this redistribution was accompanied by growth rates that were certainly more satisfactory than that observed in previous years, furthermore, the investment rate showed an increasing trend. In this interim, the distributive policy has showed to be successful to induce the growth. However, in last years the observed economic slowdown suggests a lower effectiveness of the distribution in promoting income expansion, in the bases predicted in a wage-led regime.

To conduct our analysis, beyond this introduction, the paper presents in section 2 the theoretical scheme of constraints to wage-led growth, based in the post-Kaleckian models of demand regimes and in the Minskyan hypothesis of financial instability. In section 3, we analyze the evolution of aggregate demand components and profit rate compared to the distribution path, this section also lists results of previous works that investigated the finance structure of the Brazilian firm, and, finally we examine the evolution of financial indicators related to banking supply of credit. Section 4 concludes the paper, outlining a general framework of the evolution of the variables investigated throughout the text and presenting the final considerations.

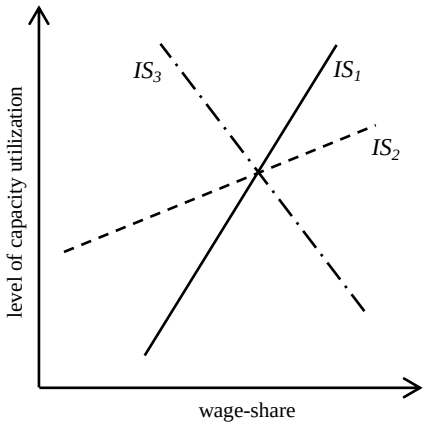
2. (Un)Sustainability of wage-led growth: the role of finance and expectations.

In the basic post-Kaleckian model, introduced by Bhaduri and Marglin (1990), an exogenous shock in wage-share has a dual impact over aggregate demand components. In a closed economy composed by two classes: workers (wage earners) and capitalists, it is assumed that consumption (savings) is positively (negatively) affected for an increase in wage-share, because capitalists have a larger propensity to save than workers. On the other hand, investment plans are discouraged by the increase in the wage-share, which, *ceteris paribus*, implies an increase in the unit labor costs, and so, a reduction in profitability and in firm's capacity to retain profits[1].

Therefore, if the planed saving is more sensitive to income distribution than investment is, an increase in wage-share induces a rise in aggregate demand, and the economy is in a *wage-led* demand regime. Otherwise, if the investment is relatively more sensitive to distribution, an increase in the wage-share causes a reduction of aggregate demand, in a *profit-led* demand regime.

[1] For sake of simplicity in this paper we call non-financial firms simply as 'firms' and financial firms as 'banks'

Figure 1: Demand Regimes



Note: I-S *locus* of equilibrium between the planned saving and investment.

Figure 1 illustrates, in the *IS* locus, three possible closures in demand regimes context, as presented in Bhaduri and Marglin (1990). IS_3 represents the profit-led case, whereas IS_2 and IS_1 represent different wage-led cases: the difference in the slope of the two curves is associated with the possibility of constraints to the accumulation process and, thus indicates when the growth path will be sustained over time.

According Keynesian tradition, the investment decision could be seen as a portfolio allocation problem in which the rate of profit is the proxy for the attractiveness of capital assets compared to financial assets. Admitted the central importance of the profit rate for the accumulation process, Bhaduri and Marglin (1990) pay special attention to the role played by this variable in the sustainment of growth. Ensuring an 'adequate' level of the profit rate is not really a question in the profit-led regime, because total profits are positively affected by the increasing profit-share and by the rise in revenues of sales. In the wage-led demand regime, in contrast, despite the increasing in revenues in response to the rising wage-share, the profit rate is negatively affected by the falling profit margin (equivalent to the profit-share). Thus, Bhaduri and Marglin (1990) identify two distinct situations:

i) In the first case (IS_1), in a scheme of 'cooperative capitalism', the reduction of profit margins is offseted by the increase in sales revenues, and the level of profit rate is able to induce a rate of accumulation compatible with the sustained growth;
ii) In the second case (IS_2), in a 'weakly wage-led' or 'conflictive wage-led' demand regime, a positive shock in wages results in profit-squeeze, and over time, the growth rate of the productive capacity does not accompany the growth rate of workforce. In this case, according

to Hein's (2016) terminology, although the demand regime is wage-led, the growth regime is profit-led[2].

This concept of growth sustainability in the wage-led 'cooperative' regime is a particular closure that is subjected to some restrictive hypotheses assumed in Bhaduri and Marglin (1990), in particular the exogeneity of the distribution and its non-dependence from agents' expectations. In order to analyses the distributive dynamics in longer term, this paper explicitly assumes the impact of expectations on the trajectory of a wage-share endogenously determined, in this sense, we pay special attention to the role of assessments with regard to firms' creditworthiness[3].

Therefore, as a start point, we assume that, in any instant in time, the wage bill, and so the level of wage-share is 'endorsed' by the firms at the moment they finance and hiring labor. Thus, the larger is the available funds to advance the hiring of labor, larger will be the possibility to expand the wage bill and, consequently, larger will be the possibility to expand the capacity utilization.

From this first assumption, we can intuitively reach a preliminary conclusion that, *ceteris paribus*, the sustainability of growth in wage-led regimes is more dependent from credit creation than in profit-led regimes. Given the Bhaduri and Marglin (1990) view concerning the central importance of maintaining an 'adequate' level of profit rate, we have that, in order to achieve the sustained growth, the effective demand needs to growth faster in the wage-led regime than in the profit-led regime[4], thus credit advances are more needful in the wage-led case.

In the remaining of this section we go ahead and demonstrate that to achieve sustained growth rates induced by wage-share increase, the economy turns itself increasingly dependent on credit creation and firms becomes increasingly leveraged. In this way, we are able to treat the question of

[2] Therefore, the idea of sustainability in Bhaduri and Marglin (1990) could be related to the availability of funding to expenditures. According authors, profit-led regimes will be sustained when the decline in unemployment provides a wage-bill increase sufficient to 'move to up' the budget constraint of representative consumer. In the wage-led case, if we assume that capital stock varies more slowly than distribution, the profit-rate increase as a condition to sustain growth could be interpreted as 'the increase of total profits' as a condition to sustain growth, which means, ceteris paribus, a higher volume of retained profits to finance new investment.

[3] At this point, we have to make clear our terminological approach. We will call 'a wage-led demand regime' that one in which a positive shock in the wage-share induces an increase (of any magnitude) on the **level** of capacity utilization and income (not necessarily in the 'longer term' rate of growth). Thus, if nothing else pressures the demand, the absence of distributive shocks will mean that the growth rate of capacity utilization equals zero. This not means to discard the theoretical possibility that a once for all shock in wage-share may be succeeded by a 'secular' higher growth rate over time. However, we opt to study the case in which shifts in wage-share are continuous, explained, for example, by an intentional policy of growth inducement via distribution.

[4] Given that: $\frac{\Delta(R/K)}{R/K} = \frac{\Delta(R/Y)}{R/Y} + \frac{\Delta(Y/K)}{Y/K}$, se $\left|\frac{\Delta(R/Y)}{R/Y}\right|_{pl} > 0 = \left|\frac{\Delta(R/Y)}{R/Y}\right|_{wl} < 0 \therefore \left|\frac{\Delta(Y/K)}{Y/K}\right|_{pl} < \left|\frac{\Delta(Y/K)}{Y/K}\right|_{wl} \mid \left|\frac{\Delta(R/K)}{R/K}\right|_{pl} = \left|\frac{\Delta(R/K)}{R/K}\right|_{pl}$, where: *pl* indicates a profit-led demand-regime; *wl* indicates a wage-led demand-regime; *R* is the total profit; *K* is the capital stock; an *Y* is the national income.

sustainability of wage-led growth on a different perspective, which associates the distributive component with the reversal of credit cycle in a Minskyan perspective.

Assuming a simplified circuit of 'Financing – Distribution – Profit appropriation – Financing', we are able to demonstrate the crucial role played by the credit in the wage-led regime, by maintaining the levels of aggregate demand, and by making feasible the continuity of the distributive path. Furthermore, we are also able to show how the firm's creditworthiness falls over time because, when sustained rates of growth are induced by increasing wage-share, the credit transactions increase as a proportion of generated income in detriment to retained profits.

We assume that, given the level of wages[5], firms hire labor in function of the expected demand, determining the wage bill and, therefore, the income distribution itself – given the level of productivity. Hence, in the short-run, the distribution and the expected demand are endogenously determined according to the functional relations of the demand regime.

The volume of new loans and the expected demand are also interdependent, since the firms needs to use some combination of retained profits and external funds to finance their operational plans, and for sake of simplicity, we will consider that available external funds are only credit transactions. Thus, in the wage-led economy, an exogenous shock in the wage rate induces an increase in the expected demand, which in its turn, leads firms to demand new loans to contract a volume of labor-force which will be remunerated with a wage bill great enough to provoke the expected distributional impact on demand.

In order to illustrate how the evolution of finance structure occurs in the wage-led regime, we construct three basic equations: equation 1 describes the retained profits as a residual of interest payments and debt amortizations; equation 2 shows the wage bill formation, but can also be understood as the financing of firm's operation; and equation 3 represents the distributive path. Where R_t are the retained profits in t, Π_t are the total profits, A_t are the debt amortizations, i_t is the interest rate, and B_t is the debt stock, so, $B_t = B_{t-1} + Cr_t - A_t$; W_t is the wage bill in t, w is the average wage, (exogenously determined), L_t is the demanded labor force, and Cr_t new credit transactions (which are function of expected demand, Y_e, and other factors, z), $ws = wL_t/Y_t$ is the wage-share of national income (Y_t), and e $\pi s_t = 1 - ws$ is the profit-share. When $\frac{\Delta Y_t}{Y_t} = \frac{\Delta Y_{t-1}}{Y_{t-1}}$ the growth path is sustained, i. e., there is no decrease in the observed growth rate:

$$R_t = \Pi_t - A_t - i_t B_{t-1} \quad (1)$$

[5] Average wages can be fixed as a mark-up over official minimum-wage, for example.

$$W_t = wL_t(Y_e) = R_{t-1} + Cr_t(Y_e, z) \quad (2)$$

$$\frac{\Delta ws_t}{ws_t} = ws_t{}^{-1}\left[\left(\frac{\Pi_{t-1}}{Y_t}\right)\left(\frac{\Delta \pi s_{t-1}}{\pi s_{t-1}} + \frac{\Delta Y_{t-1}}{Y_{t-1}} - \frac{\Delta Y_t}{Y_t}\right) - \Delta\left(\frac{i_{t-1}B_{t-2}}{Y_t}\right)\right] + ws_t{}^{-1}\left[\Delta\left(\frac{Cr_t}{Y_t}\right)\right] \quad (3)$$

Equation 2 describes how the wage bill is determined at time *t* and, assuming for sake of simplicity that others factors' cost is zero, it describes the production financing itself. Given the average wage (*w*), firms use a combination of retained profits and new loans to contract certain volume of labor, L_t, in function of the expected demand (Y_e). We admit without loss of generality that the share of total profit not used in interest payment in the current period (i_tB_{t-1}) will be reinvested in the next period to hire a part of demanded labor force ($A_t = 0$), thus the rest of the labor to be contracted will be just limited by the new credit transactions.

Equation 3 derives from 2 and presents the redistributive dynamics from its financing perspective. The first term on the left side of eq. 3 describes the possibilities of financing in an economy with no credit creation, where the increase in the wage-share in *t* ($\Delta ws_t/ws_t$) is limited by the profits previously retained. In such situation, at constant levels of productivity of factors and supposed that the economy follows a sustained growth path ($\Delta Y_t/Y_t = \Delta Y_{t-1}/Y_{t-1}$), a positive shock in the wage-share in *t* ($\Delta ws_t/ws_t > 0$) will only be possible when preceded by an increase in profit-share in *t-1*. This increase in πs_{t-1} needs to be large enough to provides the necessary funds to finance a higher expenditure with labor hiring in the current period.

Nevertheless, a reversion in the distribution signal is not compatible with sustained growth rates if the nature of the demand regime does not changes from one period to the next (from wage-led to profit-led, for instance). Indeed, subsequent increases of any magnitude in the product level needs that the distribution signal does not changes from *t* to *t-1*. In wage-led regimes, $\Delta ws_t/ws_t$ and $\Delta ws_{t-1}/ws_{t-1}$ must be positive, and such situation only happens, according to equation 3, when occurs an increase in credit transactions as a proportion of total income in *t*: $\Delta(Cr_t/Y_t) > 0$.

In other words, during a sustained wage-led growth path, the credit demand will progressively represent a higher proportion of the income generated in *t*. And this credit volume, endogenously created, will be function not only of the expected income appropriation (or of the expected demand) but also of factors *z* in equation 2, which are particularly associated to perception of agents concerning firm's ability to honor its liabilities in the future, which in turn, will affect liquidity preference of borrowers and lenders.

Therefore, at this point we are able to associate the evolution of finance structure in a wage-led growth path with the decline in firm's creditworthiness and the reversal of credit cycle. According Minskyan 'financial instability hypothesis', capitalist economies are intrinsically unstable, and during periods of economic expansion, the expectations of borrowers and lenders tend to corroborate a financing structure that is increasingly close to the speculative and Ponzi profile (Minsky 1986, 1992). Moreover, as detailed below this 'psychological tendency' is reinforced by the continuity of a wage-led distributive strategy.

Rewriting equation 1 we have:

$$r_t = 1 - a_t - i_t \frac{B_{t-1}}{\Pi_t} \tag{1.a}$$

Where: r_t is the share of total profits that is retained by firms, and a_t is the share of total profits reserved to amortization of the debt stock, henceforth the 'rate of amortization'. If a_t is kept constant, as well as the interest rate ($i_t = \bar{\imath}$), the variation in the share of total profits retained by firms equals:

$$\frac{\Delta r_t}{r_t} = -\frac{\bar{\imath} B_{t-1}}{R_t}\left(\frac{\Delta B_{t-1}}{B_{t-1}} - \frac{\Delta \Pi_t}{\Pi_t}\right) \tag{1.b}$$

An unstable dynamics in the wage-led case can be identified as that one where $\Delta r_t/r_r < 0$. Hein (2007, p. 317) recovers the Kaleckian 'principle of increasing risk' to correlate positively the share of profits retained by firms with its access to credit. Therefore, in a dynamic perspective, we can assume that the continuous reduction in retained profits when accompanied by the increase in the credit as proportion of generated income (that occurs during the period of sustained wage-led growth) would increase the debt/equity ratio of firms, and so theirs risk of insolvency.

In order to discuss the dynamics of retained profits, we first assume according to Bhaduri and Marglin (1990), as necessary condition to non-constraint of the accumulation process that the response of aggregate demand to the positive shock in wage-share is sufficiently large to rises total profits in *t*, thus[6]: $\Delta \Pi_t/\Pi_t > 0$. We also have, by definition, that $B_{t-1} > 0$. Hence, the signal of $\Delta B_{t-1} = Cr_{t-1} - A_{t-1}$ in equation 1.b will define if $\Delta r_t/r_r$ will be greater or not than zero.

Equation 4 derives from 1.b and describes the two possible paths of retained profits in function of debt stock growth:

[6] We assume, following Uemura (2000), that capital stock varies slower than aggregate demand components in the short-run, as result an increase in the mass of profits means an increase in the profit rate..

$$If \begin{cases} Cr_{t-1} > A_{t-1} & \rightarrow & \Delta B_{t-1} > 0 & \rightarrow & \frac{\Delta B_{t-1}}{B_{t-1}} - \frac{\Delta \Pi_t}{\Pi_t} \lesseqgtr 0 & \rightarrow & \frac{\Delta r_t}{r_t} \lesseqgtr 0 \\ Cr_{t-1} \leq A_{t-1} & \rightarrow & \Delta B_{t-1} \leq 0 & \rightarrow & \frac{\Delta B_{t-1}}{B_{t-1}} - \frac{\Delta \Pi_t}{\Pi_t} < 0 & \rightarrow & \frac{\Delta r_t}{r_t} > 0 \end{cases} \quad (4)$$

The possibility of an unstable dynamics take place in the wage-led regime is described in the first row of equation 4, with $\Delta r_t/r_r \lesseqgtr 0$, when we have $Cr_{t-1} > A_{t-1}$. From equation 3, we knows that $\Delta(Cr_t/Y_t) > 0$, thus $\Delta(Cr_t/\Pi_t) > 0$, because in the wage-led growth path the profit-share is falling, which means that $\Delta\Pi_t < \Delta Y_t$. Therefore, even if firms do not reduce their rate of amortization and $\Delta a_t = 0$, we have that $\lim_{t\to\infty} Cr_t - A_t = \infty$, and at some moment in time, ΔB_{t-1} will be large enough to makes $\Delta r_t/r_r$ negative, characterizing a scenario of increasingly leverage ratios. Such result is even more likely to happen if we assume, as postulated by Minsky (1986), the tendency of economic agents to corroborate speculative positions during economic expansion, which in terms of equation 4 means a declining rate of amortization ($\Delta a_t < 0$).

It follows so, that after a certain period of sustained wage-led growth, with declining retained profits and increasingly indebtedness, the economy runs on direction of the reversal of credit cycle. According Minsky (1986), the increasingly indebtedness motivate a widespread increase on risk perception which, in turn, results in a slower decrease or even in an increase in banks liquidity preference. As a result, we conclude that the expansion of credit offer may be no longer sufficient to sustain the growth path induced by distribution (since, distribution itself will be constrained by the finance shortage). Borrowers, themselves, would become reluctant to take more leveraged positions because of the risk of bankruptcy.

The non-accommodative behavior of commercial banks, in face of the deterioration of confidence levels, may be materialized either in increasing interest rates or in restriction of the credit supply. This latter happens because, in order to ensure its own creditworthiness, banks will just refuse to offer new loans to potentially insolvent borrowers – even if this clients willing to pay the market interest rate (Lavoie 1996, Ramskogler 2011). On the other hand, when firm's credit demand grows faster than the willingness of the banking sector to reduce its liquid positions, the interest rate of loans will rise (Keynes 1937). Moreover, according Wray (2007), given the level of liquidity preference, increases in interest rate also works as a 'selection mechanism' based in banks assessment concerning borrowers' creditworthiness.

Because of credit market contraction, income distribution is jeopardized by the reduction of firm's financing with external funds (eq. 3), as a result consumption, and so aggregate demand, tends to exhibit a slower growth. It is also a valid assumption that any distributive shock becomes less

effective due the bad expectations, which, in other words means that the demand regime becomes 'less wage-led' ($\partial[\partial Y_t/\partial ws_t]/\partial t<0$). This dynamics is illustrated in Figure 2:

Figure 2: Debt stock and unsustainability of wage-leg growth:

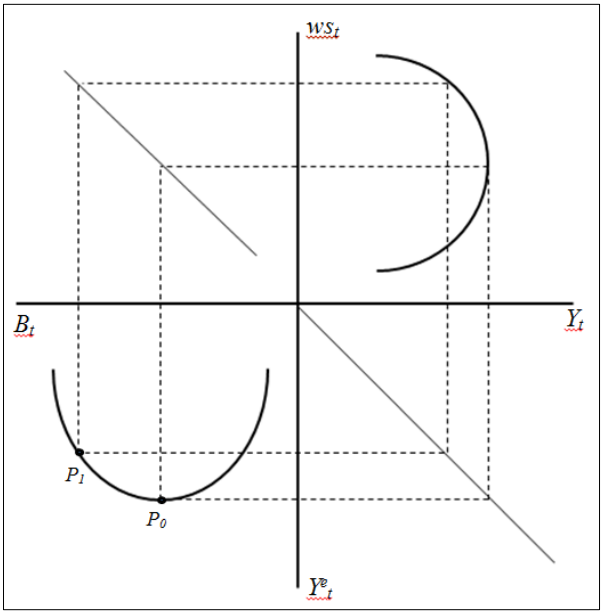


Figure 2 presents an economy where, in a first moment, the wage-share grows, financed by new credit transactions, thus the debt stock increases as well. Firms endorse the distribution, becoming more indebted, because the higher wage-share is associated with a higher expected demand – the 'wage-led relation' works and we have income increases until the economy reach the point *P0*. At this moment, advances in indebtedness are accompanied by a reversal on expected demand and, thus, by an economic slowdown. In *P1*, despite the credit shortage motivated by the reduction of firm's creditworthiness, the wage-share still increases due to flattening in the earned profits. Firms' cash flow deteriorates with the demand contraction and the worsening in (re)financing conditions, thus the debt stock keeps growing. Finally, we can extrapolate our unsustainability hypothesis, and assume a crisis of the wage-led growth strategy: the wage-share increases are no longer followed by income expansion, characterizing the instance of a profit-led demand regime ($\partial Y_t/\partial ws_t < 0$)[7].

In sum, we conclude that a development model grounded in wage-share increases could be constrained by an evolution of financial structure that had made feasible the distribution itself in a first moment. A theoretical closure that is more likely to be accepted when we assume the Minskyan financial instability hypothesis, which validity is questioned by Lavoie (1996):

[7] Figure 2 does not describes a ergodic world, thus the reversal of the profile of the demand regime in *P1* serves only to illustrative the logic behind our theoretical arguments. We not need to think as invariant or linear, over time, the relation between the volume of debt stock and the 'level of effectiveness' of distributive shock in inducing income growth.

> "When investment increases, *profits increase as well*, unless *other elements* induce reduce profits […]. Assuming away these external factors, the realized leverage ratio is just as likely to fall, although entrepreneurs and their bankers are willing to increase the debt ratio" (*ibid*, 286, emphasis added)

The argument of this paper is that the continuous increase in wage-share may work as the 'other element' pressuring profits down, at least as a proportion of the generated income. We have demonstrated above that the wage-led growth finance structure makes the value of new loans increasingly greater in relation to the income to be earned in a future of fundamental uncertainty, at same time that the share of total profits is falling. Therefore, we conclude that the 'distributive component' corroborates, or makes more likely to happen, *ceteris paribus*, the reversal of the credit cycle, as predicted by Minsky (1986), since it reinforces the effects of the psychological tendency of agents to validate increasingly leveraged positions during periods of economic expansion.

Shedding light over the evolution of financial structure in a wage-led growth path, this work demonstrates that, although the increase of macroeconomic profits is a necessary condition to sustaining the accumulation process, like proposed in Bhaduri and Marglin (1990); the faster increase of new loans, and so of the share of profits to be used in interest payments, is an intrinsic generator of instability. The reallocation of profits from the productive sphere to the financial sphere increases firm's exposition to risk, and ultimately result in the unsustainability of the strategy of induce growth via distribution.

3. The Brazilian economy in the 2000s: the wage-led growth strategy, finance structure, and credit market indicators

Since mid-2000s the wage-share has showing an upward trend in Brazil, which can be explained, among other factors, by the minimum-wage valorization policy, the deepening of governmental focalized assistance programs, and by the lower unemployment rates. At same time, the country experienced higher growth rates than that observed in the previous decade, additionally, aggregate consumption and the gross fixed capital formation also exhibit upward trajectories in this period. From this scenario, emerged in a series of academic works, the assumption of a causal relation between the distributive policies and the macroeconomic performance in Brazil, which became a subsidy to the thesis that the country has experienced a development strategy similar to the 'cooperative capitalism'[8].

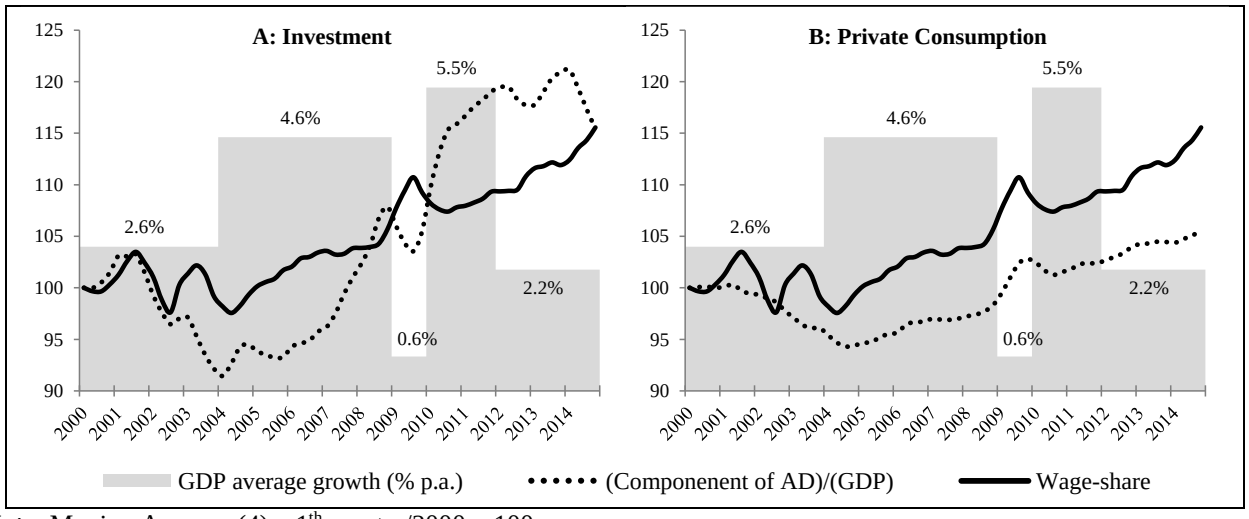
[8] Joined under the epithet of "social-developmentalists", these works advocate that the Brazilian growth strategy was based in the widespread expansion of mass consumption induced by the increasing wage-share. The whole architecture of social-developmentalism model, however, transcends such simple causal relation, and an explanation of its propositions goes beyond the scope of this paper, for a comprehensive reading, see for instance Bastos (2012), Carneiro (2012) e Bielschowsky (2012), among others.

From early 2010s to nowadays, however, the still increasing wage-share has been followed by growth rates lower than that observed in the last decade, indicating the deterioration of the wage-led relation observed in prior years. Therefore, we investigate indicators related to the relation between distribution and growth, to finance structure of the firm, and to the credit market conditions, aiming to understand in what extent the trajectory of the this variables was consistent with a dynamics that culminates with the constraint of the wage-led growth, like that one proposed in the previous section.

3.1. GDP growth, income distribution, and profit rate

Figure 3 brings preliminary evidence that Brazilian economy experienced a sustained wage-led growth since mids-2000s to early 2010s, these years presented the higher GDP growth rates registered in whole investigated period, while the wage-share followed a non-interrupted upward trend – a scenario that corroborates the thesis that the distributive policy was well succeeded in promote the growth. In this interim, only in 2009 the strong correlation between growth and distribution could not be verified, when the effects of the global financial crisis mainly explained the shock in economic activity and the observed 'pulse' in wage-share was a result of the sharp fall in profitability. The final portion of analyzed series, between 2012 and 2014, in its turn, outlined the deterioration of that virtuous wage-led relation formerly observed, presenting a dynamics of lower growth rates accompanied by the still increasing wage-share, such a dynamics that culminates in the recent Brazilian economic crisis.

Figure 3: GDP growth, Investment rate and Consumption/GPB ratio – 2000.q1-2014.q4



Note: Moving Average (4) – 1th quarter/2000 = 100
Source: GDP, investment, and private consumption from Quarterly National Accounts (IBGE, 2016); wage-share (wage bill/gross value added) estimated with data from Monthly Employment Survey (IBGE, 2016), Annual National Accounts (IBGE, 2016), and Quarterly National Accounts (IBGE, 2016).

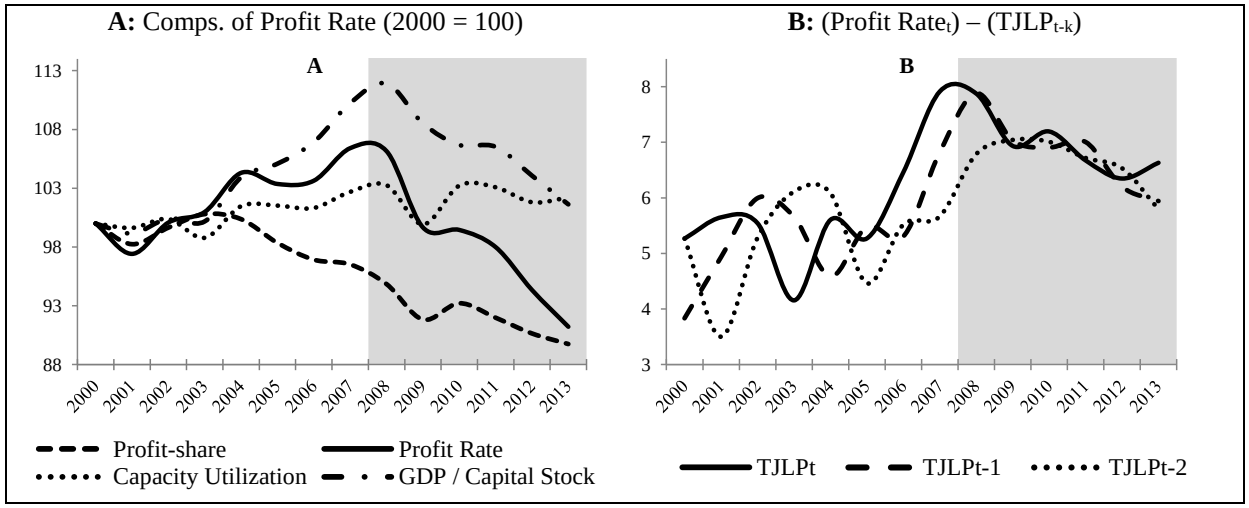
In addition to the relation between distribution and GDP growth observed before the current economic crisis in Brazil, the trajectories of the investment rate (Figure 3A) and of the consumption/GDP ratio (Figure 3B) corroborate the behavior predicted by Bhaduri and Marglin (1990) in a sustained wage-

led regime. In particular, the behaviors of the investment and of the profit rate (presented in Figure 2B) indicate that the distribution path had not been associated with a scenario of 'profit-squeeze'.

Figure 3B also shows that, over time, increases in the consumption/GDP ratio were followed by increases in the wage-share, in accordance with the hypothesis of differentials in propensities to save of capitalists and of workers. In its turn, the investment rate (Figure 3A) varied clearly in opposite direction to the wage-share in the short-run – the time trend of that series, however, accompanied the trending increase of the wage-share, over time. Therefore, in longer term, the negative effect of decreasing profit margins over the accumulation process was offsetted by the increase in sales revenues.

The evolution of the profit rate (Figure 4A) reinforces the perception that Brazilian economy followed a period of sustained wage-led growth. Until late 2000s, the profit rate path presented not only an increase trend, but also a detachment in relation to the profit-share curve and a greater adherence to the capacity utilization path. Since early 2010s, however, the profit rate exhibited a downward trend, with increasing adherence to the profit-share path, which indicates the debasement of conditions required to sustain the wage-led growth. In a Bhaduri and Marglin's (1990) framework: the still increasing wage-share was no longer able to induce an expansion in income large enough to ensure the 'adequate' profit rate.

Figure 4: Components of the profit rate and Interest rates



Sources: The profit rate was calculated by means of the multiplication of capital stock/GDP ratio at constant prices (Feenstra et al. 2015) by the profit-share. The profit-share, in turn, equals the gross operating surplus divided by the sum of the wage bill plus the mixed income, and the gross operating surplus, all series at current prices from National Annual Accounts (IBGE 2016). Data of capacity utilization are from CNI (2016) and refers to industrial sector. The long-term interest rate (TJLP) is available in BCB (2016a) and was deflated by the profit rate deflator.

Figure 4B shows, furthermore, a reduction in difference between the profit rate and the long-term interest rate in the last analyzed years, which means that the relative cost of the long-term financing had increased in terms of the investment profitability – a scenario of discouragement to the

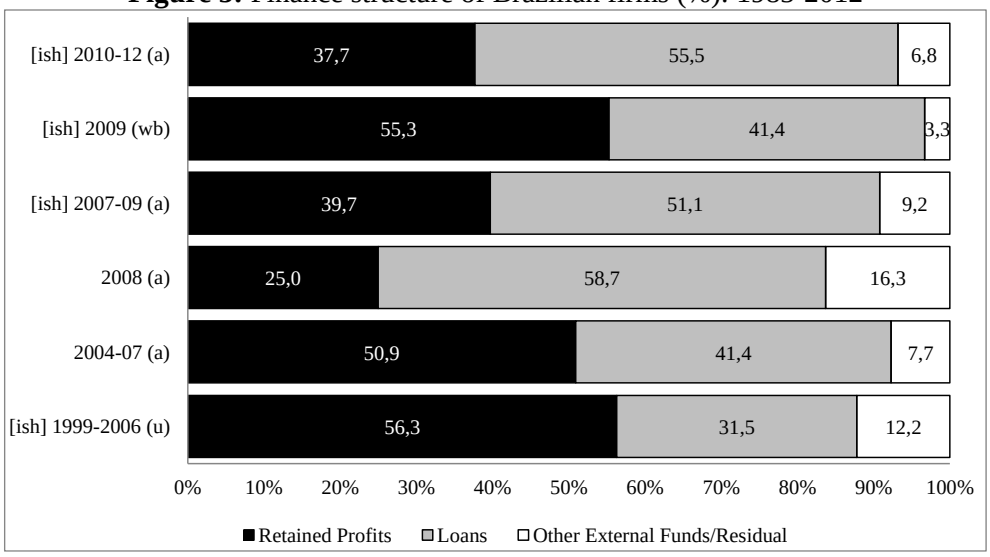
accumulation process that had preceded the culmination of the recent Brazilian crisis. The differential between the profit rate and the basic interest rate, which is a proxy to the profitability of financial assets, had also declined, indicating, in its turn, a lower attractiveness of the productive investment as a portfolio choice.

In a context of economic slowdown, the reduction of profit margins, followed by the increasing cost of financing, had tended to compress the share of profits retained by firms, reducing their capacity of self-financing. As seen in previous section, the compression of retained profits, even if interest rates had been maintained constant, is an expected result through a wage-led sustained growth path. Hence, the capacity of Brazilian economy to sustain its growth rates relied to the extent in which firms was able to substitute the retained profits by external funds (credit) in their finance structure and to the extent in which banking sector was willing to expand the credit offer.

3.2. Finance Structure of the firm

Retained profits have represented, over time, a major source of financing for firms in Brazil (Moreira and Puga 2000; Almeida *et al.* 2013). Nevertheless, Figure 5 organizes results from different studies, and shows that, since mid-2000s, the country experienced a reconfiguration of its finance structure, with increasing importance of external funds, in particular of the credit transactions.

Figure 5: Finance structure of Brazilian firms (%): 1985-2012



Notes: i) Series preceded by *'[ish]'* refer to funds effectively employed to financing investment, the other series represent the financial structure of firms ii) Studies list: *u* = UNCTAD (2008); *wb* = Word Bank (2009); e *a* = Almeida *et al*. (2013); iii) The series "*[ish] 2010-2012 (a)*" refers to a survey of expected financing of future investment.
Source: Almeida *et al*. (2013): *u*, *a*;[9] and Word Bank (2009): *wb*.

In Figure 5, data from World Bank (2009) do not permit us to conclude that, during 2000s, self-financing is no longer the main source of financing to firms in Brazil, data from Puga and Nascimento

[9] UNCTAD – United Nations Conference on Trade and Development. (2008). *World investment report 2008*. Geneva: Unctad, 2008.

(2008) and from CEMEC (2016) corroborate this point, identifying the retained profits as the main source of investment financing. Nevertheless, these both studies also point to the increasing importance of credit in the firm's finance structure, especially the loans supplied by BNDES[10]. The indicator of 'Borrowing Needs' of the non-financial sector from National Accounts (IBGE 2016) also reinforces the idea that the self-financing capacity of the firm was reduced in favor of finance via credit: the needs of borrowing raised from -7% as a proportion of total assets in 2004 to 25% in 2015 (reaching more than 30% in previous years).

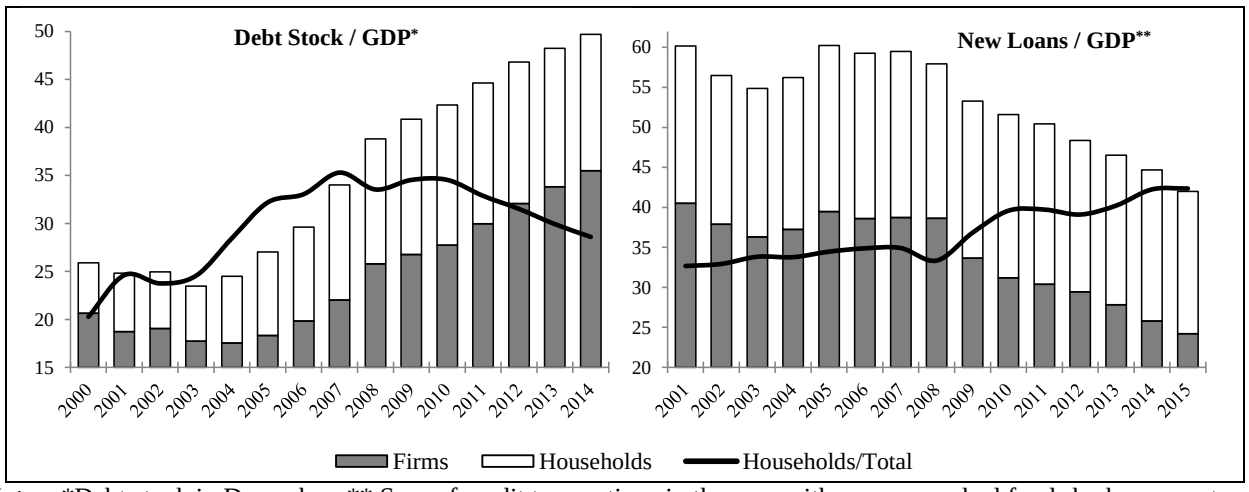
Identifying what is the principal source of funds in firm's finance structure sounds of minor relevance to the present analysis, but the consensus found in all studied works concerning the great importance of the self-financing corroborates the hypothesis of Kaleckian principle of increasing risk, which is assumed in this paper. In addition, the literature and data reveal such a dynamics of increasing importance of the new loans in firm's finance structure at the same period that wage-share had entered in an upward trend in Brazil – exactly as predicted by our theoretical framework in which the rise of credit transactions makes possible the continuous redistribution in a growing wage-led economy. In this sense, the analysis of credit supply and liquidity preference indicators, hereinafter, permits us to shed some additional light over the functional relations debated in this work.

3.3. Indicators of credit supply and Liquidity Preference

The expansion of credit offer was a remarked characteristic of the recent Brazilian growth path, and, from 2000 to 2014, the debt stock of private sector advanced from a level of 26% to almost 50% as a proportion of annual GDP. In the last years, the increasing indebtedness may be justified by the economic slowdown. In the period of accelerated growth, however, the rise of debt stock reflects a higher willingness to borrow and to lend. According to Araújo (2013), the expansion on credit demand was due to three main factors: the reduction of basic interest rate; the establishment of a stabilized macroeconomic environment, 'friendly to indebtedness'; and a policy of stimulus to expansion of credit to households.

[10] BNDES, the Brazilian Bank for Social and Economic Development, has being historically the major player of long-term financing in Brazil (Araújo and Moraes 2012), the bank's activity attenuates the financial instability because reduce the uncertainty related to availability of future flows of funds to productive projects. In late years, however, this stabilizing role has been constrained. Compulsory saving deposits traditionally used as funding source of BNDES grew slowly than the credit expansion needs. In addition, the Treasury loans, utilized to suppress this funding scarcity reached a questionable amount in terms of the fiscal cost that represent (Costa 2015).

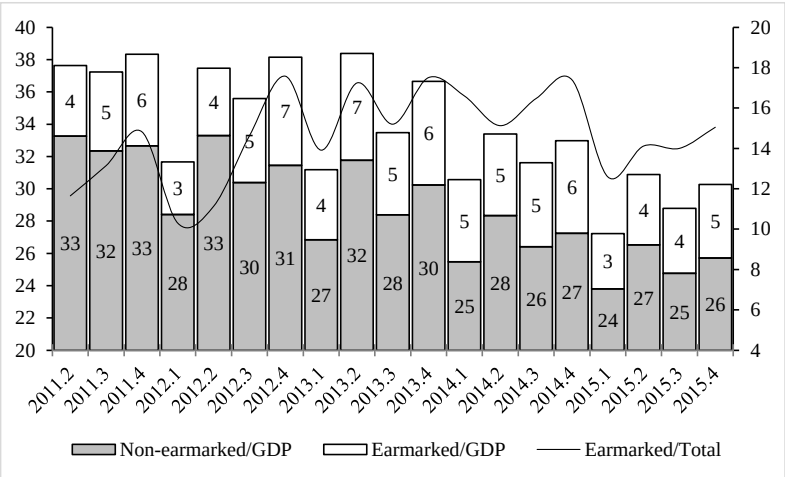
Figure 6: Debt stock/GDP and New loans to private sector/GDP (%)



Notes: *Debt stock in December. ** Sum of credit transactions in the year with non-earmarked funds by borrower type.
Sources: BCB (2016a) and Annual National Accounts (IBGE 2016)

Figure 6 shows the evolution of the debt stock and of the credit transactions with non-earmarked funds ('new loans') as a proportion of GDP during the studied period. From the late 2000s, the credit supply started to fall with a major impact suffered by the credit to firms, which decreased faster than credit to households had. The diagnosis of credit shortage do not changes when we take in account the transactions with earmarked funds. Firstly, because the non-earmarked credit represented, on average, 87.4% of the total credit transactions conceded to companies from the second quarter of 2011 to the first quarter of 2016. Secondly, because the share of earmarked credit in total transactions has not showing any significant increase since 2012 (Figure 7)[11].

Figure 7: New loans to companies/GDP (%) – Earmarked and Non-earmarked funds.

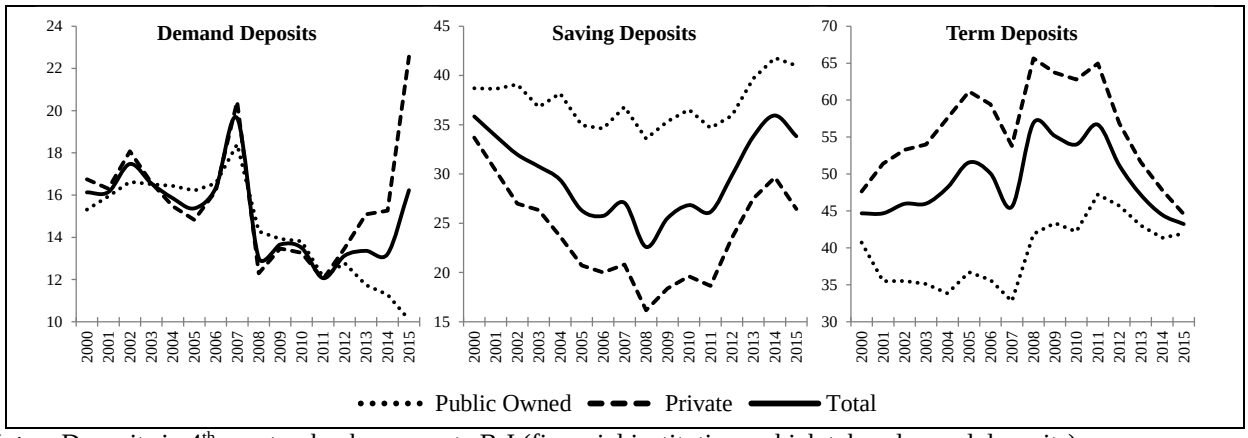


Source: BCB (2016a)

[11] BCB's (2016a) data of credit transactions with earmarked funds are available only from 2011 onwards.

As occurs with the New loans / GDP ratio, the analysis of the liability and asset positions of banks also indicate the reversion of domestic liquidity cycle in early 2010s in Brazil. At the liability side, the term-structure of banks' deposits reflects the public liquidity preference, as well the liquidity preference of banks themselves, which pursue to maintain a term alignment of their asset and liabilities operations. In this sense, Figure 8 shows a notorious restructuration in deposits structure of Brazilian banking sector, with increasing share of the liquid positions:

Figure 8: Bank deposits (% of Total deposits) – by capital ownership

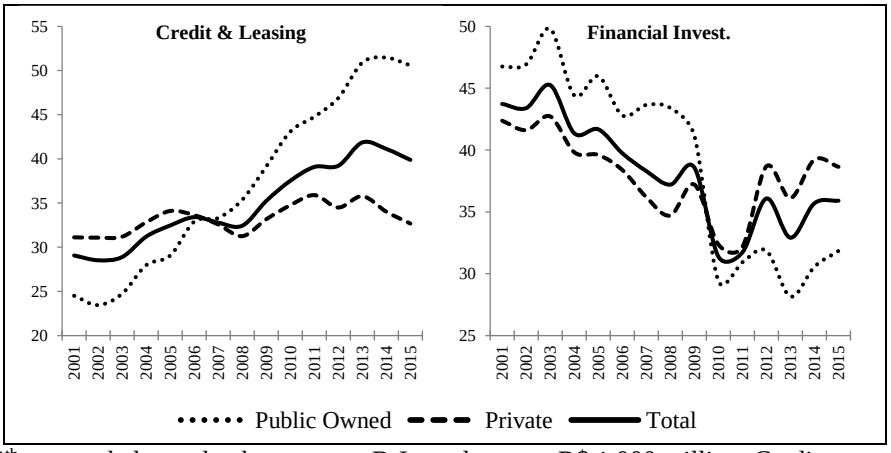


Notes: Deposits in 4th quarter, bank aggregate B-I (financial institutions which takes demand deposits)
Source: BCB (2016b)

In early 2010s, the share of demand deposits and of saving deposits (with immediate liquidity) increased abruptly while the share of term-deposits fell. In this interim, a countercyclical behavior of public owned banks could be seem in the curve of demand deposits, this intervention, however, was not able to change the trend of the sector that consolidated the choice for liquid positions.

The analysis of banking asset positions reveals the degree of confidence of the sector regarding the creditworthiness of the firm. According to Wray (2007, 15), "*all financial institutions actively construct portfolios as part of their risk management strategy. This means that they want a mix of loans and safer assets (principally, government bonds and high-grade private paper)*". Hence, the share of credit transactions in total assets of banks has to be negatively affected by the perception of insolvency of borrowers.

Figure 9: Asset operations (%) – by capital ownership

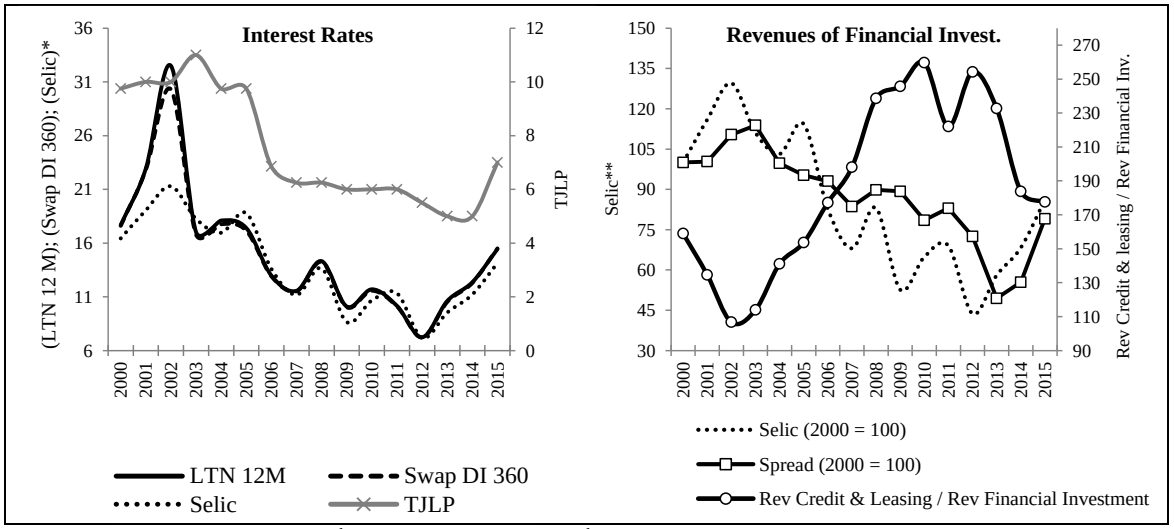


Notes: data from 4th quarter balance, bank aggregate B-I: total asset > R$ 1,000 million, Credit transactions & leasing > R$ 100 million, and Financial investments > R$ 100 million.
Source: BCB (2016b).

During almost entire investigated period, private banks maintained a stable share of the credit transactions on total assets. On the other hand, public owned banks expanded the credit operations as a proportion of their total assets – as a result the indicator of the sector as a whole increased over time. Since 2012, however, both private and public banks exhibited a decline in the share of credit transactions. Contemporaneously, on early 2010s, the share of financial investments increase as a proportion of total assets, reversing the trend observed in previous years.

The observed Brazilian banks portfolio restructuration is consistent with a perceived declining in creditworthiness of borrowers, but also may be justified by the increasing profitability of financial investments, especially of public bonds, due the rise of basic interest rate (Selic) in last years. Figure 10 shows that, during the years of faster growth, despite the decreasing in banking spread, the share of revenues from credit transaction in total revenues had become increasingly greater than the revenues from financial investments. In the years of economic slowdown, however, this trend was reversed, and revenues from financial investments have gaining increasing importance as long as the basic interest rate has upward trending.

Figure 10: Interest rates and Revenues of financial investments



Notes: *Average monthly value of 4th quarter (% p.a.). ** 4th quarter of 2000 = 100, basic interest rate (Selic) in average monthly value of 4th quarter, Annual spread, Revenues of 4th quarter (data from bank aggregate B-I, total assets > R$ 1,000 million, Credit transactions & Leasing > R$ 100 million, and Financial Investment > R$ 100 million)
Sources: Ipeadata (2016), BCB (2016a), BCB (2016b), and World Bank (2016).

Figure 10 also shows that the path of the interest rate of loans exhibited a similar trend than the basic interest rate (Selic) which is proxy for banking funding cost. The transference of costs to borrowers, however, did not occur in a linear way, and the banking mark-up varied in opposite direction to Selic rate[12]. According to Secarrecia (1998), in order to accommodate an increasing credit's demand, banks may need to restructure their liability positions, taking even more term-deposits and reducing their reserves coverage. Once, term-deposits have low liquidity they have to offer greater returns to public, which increase the cost of bank's liabilities, raising the mark-up.

Such reconfiguration in deposit's structure was observed in the Brazilian economy. During the faster growth period and of increasing credit's demand, the term-deposits raises as a proportion of banking total deposits (Figure 8), as long as the interest rate of loans had decreased slower than Selic rate. Additionally, at the time when the share of term-deposits started to falls, indicating an increase in liquidity preference in the years of economic slowdown, the banking mark-up also fells.

[12] We call 'spread' the value of interest rate of loans minus the value of interest rate of banking funding, while the 'mark-up' represents the 'margin' applied over the interest rate of banking funding (like in real-side economy's terminology). According to World Bank's (2016) data the interest rate of loans varied in the same direction of interest rate of banking funding and basic interest rate (Selic), the mark-up, however, varied in opposite direction to that interest rates. In figure 8, the observed minor volatility of the spread when compared to the Selic curve, illustrates such result. Data from BCB (2016a) related to the spread of credit transactions to firms (non-earmarked funds) corroborate this behavior presented by World Bank's data.

4. General framework and concluding remarks

The indicators analyzed in this paper point out to a reversal in the liquidity cycle in Brazil that coincides with the transition from a period of faster growth in 2000s to a period of economic slowdown in the last years. The characteristics that distinguish these two periods are summarized in box 1:

Box 1: Characteristics of the periods of Rapid growth and Slow Growth

Rapid Growth	Slow Growth
• Increasing wage-share; • Increasing indebtedness of firm; • *Increasing* profit rate; • Profit rate curve adherent to *capacity utilization* curve; • *Increasing* gap profit rate / interest rate; • Slow *growth* and *stability* of ratio New loans / GDP; • *Decreasing* Liquidity Preference measured by banking deposits; • *Increasing* share of credit transactions in total banking assets; • *Decreasing* share of financial investments in total banking assets; • *Increasing* ratio Revenues from credit transactions / Revenues from financial investments; • *Decrease* of basic interest rate and of interest rate of loans; • *Decreasing* banking spread in absolute values;	• Increasing wage-share; • Increasing indebtedness of firm; • *Decreasing* profit rate; • Profit rate curve adherent to *profit-share* (profit margin) curve; • *Decreasing* gap profit rate / interest rate; • *Reduction* of ratio New loans / GDP; • *Increasing* Liquidity Preference measured by banking deposits; • *Decreasing* share of credit transactions in total banking assets; • *Increasing* share of financial investments in total banking assets; • *Decreasing* ratio Revenues from credit transactions / Revenues from financial investments; • *Increase* of basic interest rate and of interest rate of loans; • *Increasing* banking spread in absolute values;

The increasing liquidity preference and the credit shortage, which followed the progressive indebtedness of firms, compose a scenario characteristic to the reversal of Minskyan cycle in Brazil. At the same time, the observed lower growth rates accompanied by a still increasing wage-share reveal a reduction in the effectiveness of the distributive shocks to induce income expansion in a wage-led growth regime. Additionally, the observed reduction in the profit rate and its increasing adherence to profit-share trajectory over time, indicate that 'profitability effect' became more significant in determining the total profits than the expansion of revenues, which characterizes a situation of constraining to accumulation process in the seminal model of Bhaduri and Marglin (1990).

The theoretical framework constructed in this paper linked the prediction of growth constraining in Minskyan and post-Kaleckian theories. Making distribution endogenously determined in function of expectations, we present a cumulative-causation logic in which the *pari passu* occurrence of continuous distribution towards wages and of the increasing credit/GDP ratio is a necessary condition

to achieve sustained wage-led growth. As a result, the finance structure of the firm changes towards a sharing in which credit rises in detriment of retained profits. For this reason, the wage-led dynamics tends to undermine the creditworthiness of the firm over time. Therefore, the distributive component in Bhaduri and Marglin (1990) wage-led model reinforces the psychological tendency, predicted for Minsky (1986), of agents to corroborate increasing indebtedness positions during economic expansion.

As seen in Box 1, the Brazilian economy has presenting, since the 2000s, a framework very similar to the theoretical scheme of rise and fall of economic activity in which the distributive variable was the inducer of growth, but also contributed to (and was affected by) the reversal of credit cycle.

From mid-2000s to early 2010s, the Brazilian economy experienced a combination of accelerated growth and income distribution towards wages. The credit expansion allowed that firms paid a wage bill increasingly greater than income, and they did that because expected a positive impact of distribution over demand. Firms became increasingly indebtedness and the indicators of liquidity preference, interest rates, and balance sheets of banks showed that, at that period, the lenders had a high confidence on firms' capacity to fulfill their financial commitments. The Brazilian economy had presented the conditions to sustain a wage-led growth strategy.

However, as predicted by our theoretical scheme, the debt stock kept growing, pushed by the credit expansion and the distributive pressure over retained profits. Then, since early 2010s, the country started to show a deterioration of that conditions required to sustaining a growth path induced by wage-share increases. We observed a downward trend of the 'New loans / GDP' ratio, which 'broke' the dynamics of financing of labor hiring in a growing wage-led economy. The wage-share continued to grow despite the credit shortage because of the flattening of profits when economic slowdown arose. Additionally, all financial indicators pointed to a banking prudential response to the undermining of firms' creditworthiness.

Reinforced by the reversal in international liquidity cycle, the shortage of domestic credit supply may be understand as an outcome of the wage-led growth strategy – and the all analyzed indicators corroborate this interpretation. Hence, the successful wage-led growth model of the 2000s may have found in its own evolutionary dynamics the reason for its collapse in the 2010s.

Finally, an additional point must be highlighted, the entire theoretical analyzes carried out in section 2 takes interest rates as a constant, in the Brazilian economy, however, the behavior of this variable corroborated the scenario of sustainment and non-sustainment of growth. In the period of rapid growth, the downward trend of basic interest rate implied in minor financing costs to firms, boosting credit demand and decreasing the debt load with post-fixed rates. In this scenario, the proportion of

total profits that goes out from productive sphere towards interest payments is lower, which allow firms to maintain a lower indebtedness position.

Since early 2010s, the basic interest rate had been showing an upward trend, justified by its use as the instrument of inflation control under the inflation target regime. In addition to compressing the profitability of productive investment when compared with financial assets, this administrative decision may have contributed to weakening the financial position of firms that, in order to endorse the wage-led strategy, had assumed an increasingly leverage position during that years of economic expansion and low financing cost via credit. Therefore, the choice of a higher basic interest rate in the 2010s cooperated to the dismantling the conditions that gave support to continuity of the strategy to growth via distribution.

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