A Post-Kaleckian-Rangelian Approach to Recent Brazilian Experience of Wage-Led Policy

Hugo Carcanholo Iasco Pereira - hclpereira@cedeplar.ufmg.br
Fabrício J. Missio - fjmssio@cedeplar.ufmg.br

Abstract:

The aim of this paper is to understand the dynamic of Brazilian economy between 2012 and 2015 using post-Kaleckian and Rangelian theories. The wage-led policy adopted in Brazil means an exogenous change of income distribution in favor of workers. The theoretical results shiwed that, if the economy has wage-led properties, the conflict distributive is resolved through real growth of GDP. But, if the economy has profit-led properties, GPD will decrease. Yet, the oligopolistic entrepreneurs will rise the prices to maintain the profitability and the profit share, creating an inflationary process that transfers income of workers to entrepreneurs. In face of current workers difficulties to get the standard consumes and the decrease in working capital of companies, the Government increases credit, which constitutes the sanctioning factor of inflation. Thus, the inflation, that is a real phenomenon, has the false appearance of monetary phenomenon. The empirical estimations using OLS and VAR regressions corroborated the theoretical results to Brazilian economy between 2006 and 2015.

Key Words: Income Distribution; Economic Growth; Inflation; Wage-led policy

1 - Introduction

Recently, the Brazilian economy suffered an inflationary acceleration process, with a recession in terms of rate of utilized installed capacity[1]. The Brazilian goverment created a cycle of wage's overvaluation since 2003, the minimum wage had a real growth of 77,18% between 2002 and 2016 (Dieese, 2017). An important turning point was the law 12.382[2], that determines a specific index to readjust the minimum wage considering the preceding year inflation and the rate of real GDP's variation of two years ago since 2011 until 2021. Under the orientation of inflation targeting, the Central Bank increased SELIC prime rate to control the inflation, which has gotten worse the economy in terms of growth rates because it has enhanced the recession and required two years to control the inflationary process. This inflationary perception is in line with monetarist approach, according to which the inflation is caused by the expansion of money stock through government spending (fiscal dominance hypothesis).

However, there are alternative interpretations on the inflationary problem. In Latin-American structuralist literature (Aujac, 1954; Noyola, 1954; Sunkel, 1956; and Furtado, 1957) inflation is understood as result from distributive conflict. In these terms, although with considerable heterogeneity, the inertial inflation's theories (Lara-Resende, 1979; Lara-Resende and Arida, 1986; Lopes, 1986; and Bresser-Pereira and Nakano, 1986) brought up an explanation based on distributive conflict to shed light on Brazilian 1980's inflation as counterpoint to monetarists explanations. One cornerstone of the inertial theory of Bresser-Pereira and Nakano (1986) was Ignacio Rangel's (1963). According him, the oligopolistic sectors, desiring to maintain the rate of profit, increase the price's level in face of decrease the effective demand. This micro-economic behavior creates a process of inflationary acceleration with recession, transferring worker's income to the oligopolistic sectors.

Based upon Kalecki, there are two formulations in which the distribution of income is the central vector to determine the economic performance in terms of rate of utilizing installed capacity: neo-Kaleckian and post-Kaleckian models (Arestis and Trancoso, 2017). The first one is characterized by idea that the distribution of income can change the intensity of investment and capitalist consume, but does not determine the direction of growth. But, to post-Kaleckian models, the profit share affects the investment and, hence, the GDP (Arestis and Trancoso, 2017). Thus, it is possible that economic system

[1] See Graphs 1 and 2 in the appendix.
[2] See www.planalto.gov.br/ccivil_03/_Ato2011-2014/2011/Lei/L12382.htm to obtain more details.

responds in different ways in terms of GDP relying on structural characteristics. The inflation is seen as product from distributive conflict. Concerning Rowthorn (1981), the inflation arises from the demand of capitalists and workers for higher share in GDP. We argue that is possible to connect the last interpretation with Rangelian approach.

The aim of this paper is to understand the foregoing dynamic of Brazilian economy. For this purpose, we formulated a specific model to Brazilian economy incorporating the index mechanism of minimum wage of law 12.382. The theoretical results showed that this wage-led policy increases the sensibility of income distribution to real growth, i.e, the economy should grow up at least the sum of the preceding year inflation and the GDP's variation of two years ago to maintain the income distribution's *status quo*. But, if the economic system has wage-led properties, the distributive conflict is resolved across the real growth. If the economic system has profit-led properties, the economy will present recessive characteristics, which implies on an inflationary process through the price's increase of oligopolistic sectors deriving from the attempt to defense the profit rate. Our econometric estimations corroborated the theoretical results, suggesting profit-led characteristics to the Brazilian economy and a negative relation between profit and inflation.

The structure of this paper is organized as follow. Section 2 describes and discusses the model with the index mechanism of minimum wage in line with Hein (2014), relating it to Bhaduri and Marglin (1990) discussion about the growth's regime and the inflationary process according Ignacio Rangel (1963) in section 3. The section 4 presents the empirical results from an econometric exercise to Brazilian economy. Section 5 closes the paper with the conclusions.

2 – Distribution of Income, Growth and Inflation in Theoretical Perspective

In our model, the economy is assumed to be closed, without government and there is just one sector, the industrial. Following Hein (2014), the price's level to each sector *j* at time *t* p_t is determined by a mark up's rule $(1 + m_j)$ under the costs represented by nominal wages w_t multiplied by the inverse of productivity per worker a_t and the price of raw materials p_m multiplied by the raw materials per unit of final output μ_j. The mark-up is represented by m_j:

$$p_{j,t} = (1 + m_j)(w_t a_j + p_m \mu_j);\ m_j > 0 \quad (1)$$

The unitary relation between the costs of raw material and workers can be expressed by:

$$z_j = \left(\frac{p_m \mu_j}{w_t a_j}\right) \quad (2)$$

Thus, we can rewrite the equation (1) as:

$$p_{j,t} = \left(1 + m_j\right)[w_t a_j \left(1 + z_j\right)] \quad (3)$$

While the unitary gross profit $\left(\frac{\pi}{y}\right)$ is represented by:

$$\left(\frac{\pi}{y}\right)_j = m_j\left(w_t a_j + p_m \mu_j\right) = m_j w_t a_j \left(1 + z_j\right) \quad (4)$$

The gross profit share h_j is given by the ratio between the gross profit π_j and the total sum of capitalist π_j and worker's income w_j:

$$h_j = \frac{\pi_j}{\pi_j + w_j} \quad (5)$$

Replacing the equation (4) into (5), we obtain:

$$h_j = \frac{1}{1 + \frac{1}{\left(1 + z_j\right) m_j}} \quad (5.1)$$

The profit share is determined positively by the mark-up m_j, and negatively by vector z_j. The law 12.382 lay down an index to adjust the nominal wage taking the last year's inflation ρ_{t-1} and the real growth rate of GDP from two years ago q_{t-2}.

$$w_t = w_{t-1}(1 + \rho_{t-1} + q_{t-2}) \quad (6)$$

This index mechanism increases the nominal wages through real growth in favor of worker's income, and decreases the vector z_j. According equation (5.1), *ceteris paribus*, reductions on this variable decrease the gross profit share and, hence, reinforce the social conflict between workers and capitalists around the national income. The inflation is a phenomenon derived from the difference between wanted profit rate by capitalist and indeed rate. According Wood (1975), Eichner (1976) and Hancourt and Kenyom (1976), to maintain the wanted capital's accumulation g_g, the companies need to obtain the wanted profit rate r_g, which is defined as (Hein, 2014):

$$r = \frac{\pi}{py} \frac{y}{y^p} \frac{y^p}{k} \quad (7)$$

Where py is the nominal output, y^p the potential output given by the capital stock, y the real output, k the capital stock. So, we can re-write the equation (7) as:

$$r = h\, u\, \frac{1}{v} \quad (8)$$

With h denoting the profit share, u the rate of utilized capacity and v the capital-potential output ratio. The companies do an assumption on the normal rate of utilized capacity ($u =$

u_n) to define prices. Therefore, the enterprises choice the mark-up m_g to achieve the wanted rate of profit r_g as follow:

$$r_g = h\, u_n\, \frac{1}{v} \tag{9}$$

Substituting the equation (5.1) into (9) and solving for m_g, we obtain:

$$m_g = \frac{1}{\left[\frac{(1+z)-(1+z)r_g\frac{v}{u_n}}{r_g\frac{v}{u_n}}\right]} \tag{10}$$

The equation (10) shows the mark-up that ensures the wanted rate of profit r_g. Taking the derivative in relation to z_j, it is possible to notice that the relation between increases in nominal wages and mark-up is negative:

$$\frac{dm_g}{dz} = -\left[\frac{1-r_g\frac{v}{u_n}}{r_g\frac{v}{u_n}}\right] < 0 \tag{11}$$

Considering that the law 12.382 entered into force in 2012, the nominal wage of 2013 is higher than 2012. In our model with endogenous mark-up, *ceteribus paribus*, this law corresponds to decreases on z_j and, consequently, leading to an increase on mark-up m_j. In another way, we have that w_t will be greater than w_{t-1}, for this reason, $z_{j,t}$ will be smaller than $z_{j,t-1}$ and, hence, there is the tendency of reduce the profit share since $\frac{dm_g}{dz} < 0$. Beyond that, the dynamic originating from the nominal wage's growth causes prices increases, because the companies will up the prices to maintain profit rate.

This perception means a distributive conflict between entrepreneurs and workers around a higher share of income into real GDP. As the indexing of wages is discrete, the entrepreneurs will recompose the real income increasing the prices until the profit share reaches the desired level (Rowthorn, 1977). Therefore, the inflation is a real phenomenon that reconciles the distributive conflict according to the real possibility of economics, which can be written as (Rowthorn, 1977):

$$\dot{P} = \Omega(r_g - r) \tag{12}$$

The nominal national income $p_t y_t$ can be understood as the sum of worker's income (total wage bill: w_t) and the capitalist's income (total of profit: π_t), i.e., $p_t y_t = w_t + \pi_t$. If the demand of both classes exceeds the real output, the inflation is the vector that compatibilizes the class conflict transferring the real gain of workers to oligopolistic sectors. The inflation allows that the inequality $p_t y_t < w_t + \pi_t$ becomes on equality again, i.e., $p_{t+1} y_t < w_t + \pi_t$, with $p_{t+1} > p_t$. In sum, *ceteris paribus*, the nominal salary increase modifies the functional distribution of income between workers and capitalists,

decreasing the profit rate, so the capitalists (oligopolist) increases the prices to defend the profit share.

However, the productivity can change over time. If the ratio worker-output decrease (increase), the vector $z_{j,t}$ raises (decreases) leading to gains (decrease) on profit share, which consequently results in growth (fall) on profit rate. Considering that the productivity of workers is raising, the effects of real growth of nominal wages on income distribution between workers and capitalists can be mitigated. Concerning equation (2), a diminishing on ratio workers-output a_t can offset the real growth on wages due to law 12.382. This means that, to functional income keep unchanged, it is necessary that productivity grows at the same rate than real growth of nominal wage.

Based on assumption that productivity growth depends on the national income's dynamic (Verdoorn, 1949; and Kaldor, 1966), the intensity of distributive conflict depends on income growth. When the growth rate of income (Δy) is equal to adjustment that the law 12.382 enforced to nominal wage (Δw), there are no changes on income distribution. But, if $\Delta y > \Delta w$, it is possible that the salary adjustment grows even more that the index proposed by law 12.382 without changing the functional distribution of income. However, if $\Delta y < \Delta w$, the distributive conflict becomes more strong, reducing the profit share and, therefore, enlarging the share of national income belonging to workers. Therefore, the law 12.382 requires that the productivity growth be, at least, equal to the nominal wages readjust rate to income distribution keeps unchanged.

We argue that there is two ways of economic system, *ceteris paribus*, react to wage-led policy. First, through inflationary process; the capitalists increase the prices to reach the wanted profit rate. Second, through economic growth, i.e., $p_t y_{t+1} > w_t + \pi_t$, with $y_{t+1} > y_t$, but this possibility depends on structural characteristics of economy as suggested by Baduhri and Marglin (1990). Thus, considering the model of Bahduri and Marglin (1990), the saving function is:

$$S = shz \tag{13}$$

Where h is the profit share of national income and z is the rate of utilized installed capacity, both parameters are between zero and the unity. The distributive conflict between workers and entrepreneurs can be written as:

$$(1+\tau)\left(\frac{W}{P}\right) = (1-h)^{-1}\left(\frac{W}{P}\right) = \frac{1}{a} \tag{14}$$

Equation (14) shows that an increase in real wage decreases the profit share into national income and hence reducing the saving.

Bahduri and Marglin (1990) assume that investment depends on profit share *h* and rate of utilizing installed capacity *z*:

$$I = I(h, z);\ \frac{\partial I}{\partial h} > 0; \frac{\partial I}{\partial z} > 0 \quad (15)$$

The macroeconomic identity between saving and investment (IS curve) implies that:

$$shz = I(h, z) \quad (16)$$

The inclination of IS curve is $\frac{dz}{dh} = \frac{(I_h - sz)}{(sh - I_z)}$. Assuming that $sh - I_z > 0$, the IS curve inclination is related to difference between the coefficients of investment's sensibility to alterations on profit share, and the relation between marginal propensity to save and the rate of utilizing installed capacity. So, there are two possibilities of the growth's regime:

i- $I_h > sz$ ($\frac{dz}{dh} > 0$): the IS curve is positive and investment is the main element on aggregated demand. Exogenous changes on distributions of income in favor of profits cause economic growth through expansions of capital accumulation; profit-led regime.

ii- $I_h < sz$ ($\frac{dz}{dh} < 0$): the IS curve is negative and consume is the main determinant of aggregated demand; wage-led regime.

The profit (wage)-led regime implies that an exogenous change on the distribution of income in favor of profit (wage) increases (decreases) the rate of utilizing installed capacity. Lavoie and Stockhammer (2006) indicated that the regime of economy depends on structural and institutional characteristics. According them, there are four possible combinations. A distributive policy in favor of capital to an economy under the profit (wage)-led regime results on expansion (stagnation/instability) of aggregated demand. However, a distributive policy in favor of workers in an economy under the wage (profit)-led regimes results on expansion (stagnation/instability) of aggregated demand.

A wage-led policy creates an inequality, $p_t y_t < w_t + \pi_t$, which creates different results depending on economic regime. In a wage-led economy, this exogenous change on income distribution becomes real economic growth. Thereby, that inequality becomes an equality again through increases in y_t: $p_t y_{t+1} = w_t + \pi_t$, where $y_{t+1} > y_t$. In a profit-led economy, exogenous change on the distribution of income does not become economic growth. The increase in wage share creates a distributive conflict around the national income, resolved by the inflationary process abovedescribed. So there is a tendency to depression of output as the exogenous change in income's distribution is imposed on profit-led economic system. The oligopolistic entrepreneurs will raise the prices to

maintain the profit share into national income. These results are discussed in next section considering Ignacio Rangel theory on Brazilian inflation.

3 – The Ignacio Rangel's approach to Brazilian Inflation[3]

According Rangel (1963),inflation is the manner that Brazilian economy defends itself from depression. As the industrial reserve army becomes higher, the amount of wage decreases, increasing the exploration of economic system, which, in turn, reducing the magnitude of marginal propensity to consume. The Keynesian multiplier of income becomes smaller. As consequence, the level of exploitation of workers determines the size of impact of investment on income, thereby the Brazilian economy growth would be dependent from a greater investment each time (Rangel, 1963).

As the Keynesian multiplier is low, the dynamic of real income relies on constant rates of increase on investment. Rangel (1963) argues that the economy tends to overinvestment, creating idle capacity. Nevertheless, as new opportunities to entrepreneurs to invest don't come up, the economy tends to recession. The inflation arises as a manner of Brazilian economy defends itself from the tendency to depression (Rangel, 1963). The argument becomes perspicacious when the following quote is shown:

> Meanwhile, we can define the strategic function of inflation: it is a mechanism of defense of economy against the trend's reduction of investment, which, if done, would result on economic depression. In other words, that could be a depression makes the shape of inflationary process (Rangel, 1963, p. 62, translated by authors).

The Rangel's (1963) argument is that inflation depress the agent's liquidity preference. The entrepreneurs, in turn, defend the surplus value accumulated in monetary form transforming it on investment even that corresponds to idle capacity.

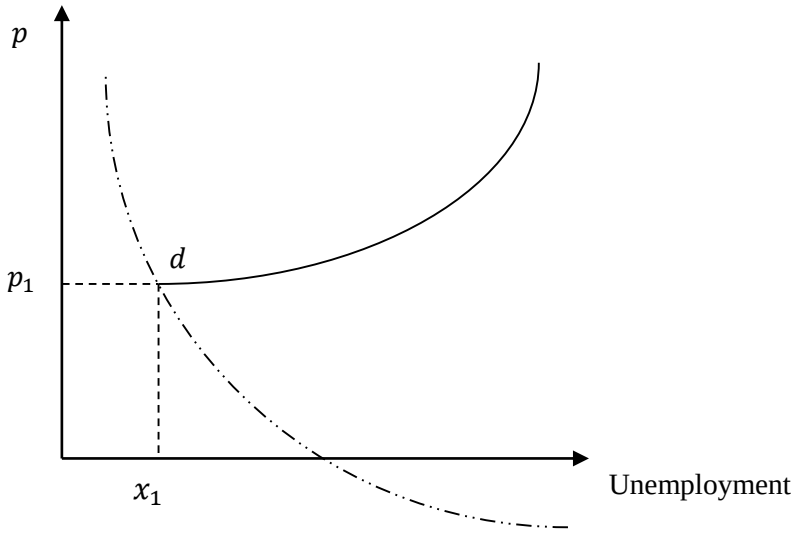
Bresser-Pereira and Nakano (1984), using the Rangelian theory, argues that the oligopolistic entrepreneur's behaviour in an economic depression is characterized by administrated inflation because these sectors raise the prices to maintain the profitability:

[3] Ignacio Rangel was an important brazilian economist, who was born in 1914 at Mirador-MA and has died in 1994 at Rio de Janeiro – RJ. His work is practicly unexplored by economists, which encompass some themes, as economic development, inflation, Marxist theory, agrarian reform, cicle's theory and etc. It is important highlight that he had not an usual economicist formation, he has studied law and economic theory as self-taught. He has done a graduate (his only formation in economics) at CEPAL with Raul Prebisch, Celso Furtado, Anibal Pinto and Oswaldo Sunkel. Besides that, he has held many important offices during his professional life: economist responsible for the fulfillment of Plano de Metas in the Juscelino Kubitschek government; personal advisor of Getulio Vargas in his second government; he worked at ISEB, and, lastly, he was a former economist-chief of BNDE (his influence on economic Brazilian thought was so strong, that the former president João Goulart invited him to occupy the office of Minister for Economy, which was denied by Rangel).

> To maintain the rate of profit (the ratio profit-capital), the companies of oligopolistic sector will rise its mark-up during the recession. Thus, the decrease on sales is offset by rises on mark-up, mantaing Constant the profit and the profit's rate (Bresser-Pereira and Nakano, 1984, p. 09). (translated by authors)

The relation between recession and inflation was denominated as Rangel's curve by Bresser-Pereira and Nakano (1984). The Rangel's curve suggests an inverse relation between unemployment and inflation *p* until the point where in a reduction in sales decreases the profitability (point *d*), from that the oligopolistic companies raise the prices to maintain the profitability. This process creates an inflationary spiral because the unions of workers will demand higher nominal wages to recompose the real wage, increasing the costs of companies, reducing their mark-up. The Phillips curve will move upwards, implying in a positive and crescent relation between the inflation and the unemployment (Moreno and Modenesi, 2014). The Figure 01, below, shows this relation.

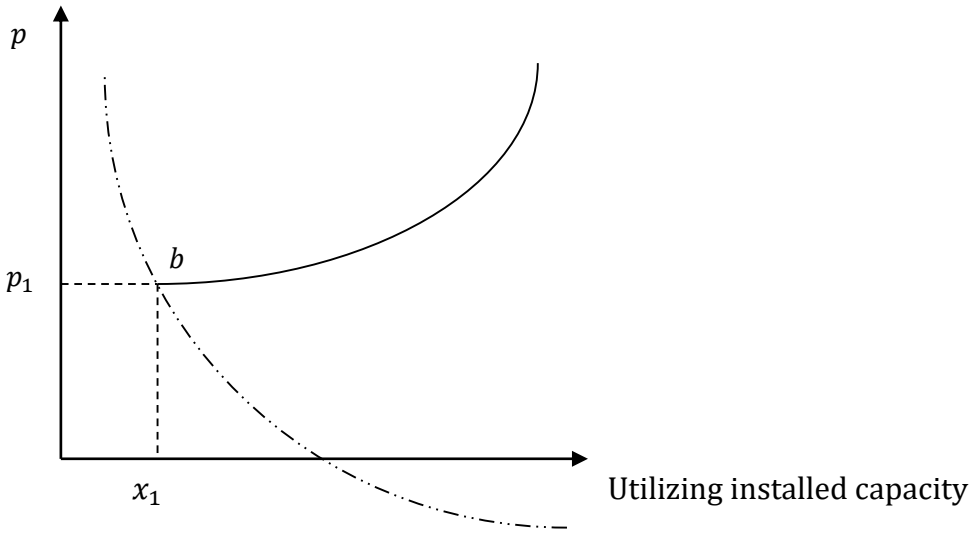
Figure 01- Rangel's curve



Source: Adapted from Moreno and Modenesi (2014)

We propose an alternative specification of Rangel's curve: the inflation is a function of the rate of utilizing installed capacity. The dynamic of this specification is very similar to the version of Bresser-Pereira and Nakano (1984) to Rangel's curve, but instead of unemployment, it is the rate of utilizing installed capacity in the x-axis. The dynamic of Rangel's curve suggests that prices of oligopolistic sector decrease until the point *b*, where the profit has not changed so far. From this point, decreases on demand and, so, on rate of utilizing installed capacity provokes a falling on profit share into GDP. Thus, the entrepreneurs increase the prices.

Figure 02- Adapted Rangel's Curve



Source: Done by authors from the version of Moreno and Modenesi (2014)

Rangel (1963), as Bresser-Pereira and Nakano (1984), does not deny the correlation between the money stock and inflation, but the causality is reverse to them. Mathematically, from the monetarist identity:

$$M.V = P.Y \tag{17}$$

Where *M* the money stock, *V* the speech of movement, *P* the price's level and *Y* the real output. The inflation *via* distributive conflict generates the following unequality:

$$M.V < P_1.Y \tag{18}$$

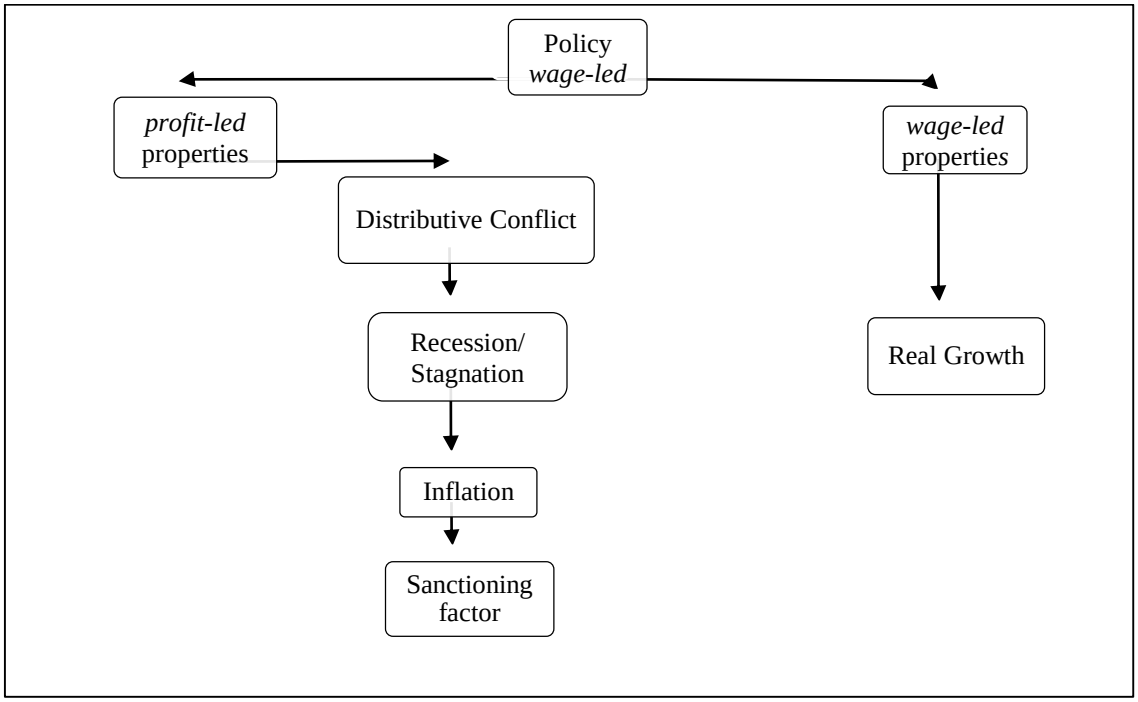
Bresser-Pereira and Nakano (1984) argues that the monetary expansion is the sanctioning factor of inflation. The inflation reduces the real money stock, leading economy to liquidity crises and thereafter to slowdown and recession. Given the Bresser-Pereira and Nakano's (1984) assumption that the economic agents bear upon the recession, the government will expand the money stock through monetary policy (credit to worker consume and credit for working capital to companies) (Rangel, 1963). The unequality becomes an equality again, with a greater money stock ($M_1 > M$).

$$M_1.V = P_1.Y \tag{19}$$

In short, a wage-led policy among the lines of law 12.312 means an exogenous change of income distribution in favor of workers. If the economy has wage-led properties, the conflict distributive is resolved through the real growth of GDP. However, if the economy has profit-led properties, the GPD will decrease. The oligopolistic entrepreneurs will rise the prices to maintain the profitability and the share of profit into GDP, creating an inflationary process that transfers income of workers to entrepreneurs. The Government will increase credit, which constitutes the sanctioning factor of inflation.

Thus, the real phenomenon that arose from distributive conflict becomes a monetary phenomenon. The figure below resumes the theoretical conclusions.

Figure 02- Theoretical Conclusions



In next session we estimated the empirical relation between income distribution, growth and inflation to Brazilian economy to period between 2006 and 2015.

4 - Econometric Estimations to Brazilian Economy

The data used in econometric estimations are quarterly, corresponding to the period between March/2006 and December/2015. All variables are index number, the period base is the immediately preceding. The variable profit was calculated by us using the database of nominal revenues and costs done by CNI (see Appendix B). The rate of utilizing capacity installed is offered by CNI, while the monthly inflation is calculated by IBGE[4]. The seasonal adjusted was done using ARIMA-X13, while the trend was treated through the Hodrick-Prescott filter. The graphs of profit, rate of utilizing installed capacity and inflation are available on Appendix A.

The empirical strategy is to estimate the relations between inflation and profit share, and utilizing installed capacity and profit using ordinary least square (OLS) and vector autoregressive (VAR). The equations estimated by OLS are:

Model 01: $\text{Inflation} = b_0 + b_1 \text{Profit} + \varepsilon_t$

[4] The transformation from monthly rate of inflation to quartely was done by authors.

Model 02: $\text{Utilizing installed capacity} = b_0 + b_2\text{Profit} + \varepsilon_t$

It was estimated two models using VAR, one using the original methodologies of Sims (1980), and other using Toda and Yamamoto (1995). Both models were estimated with the three variables. So, the system of equations estimated using VAR (3) is:

$$\text{Inflation} = \theta_{11}\text{Inflation}_{t-k} + \omega_{12}\text{Profit}_{t-k} + \Psi_{13}\text{Utilized cap.}_{t-k} + \varepsilon_{\text{inflation,t}}$$

$$\text{Profit} = \theta_{21}\text{Inflation}_{t-k} + \omega_{22}\text{Profit}_{t-k} + \Psi_{23}\text{Utilized cap.}_{t-k} + \varepsilon_{\text{profit,t}}$$

$$\text{Utilized Cap.} = \theta_{31}\text{Inflation}_{t-k} + \omega_{32}\text{Profit}_{t-k} + \Psi_{33}\text{Utilized cap.}_{t-k} + \varepsilon_{\text{utilized cap.I,t}}$$

The information criteria AIC, BIC, HQC suggested that the appropriate number of lags to VAR model is one. Notwithstanding, an assumptions of VAR models is the stationarity of variables. The tests ADF, ADF GLS and KPSS don't reject the null hypothesis of root unity to three variables. The proceeding of this paper is estimate the VAR using the variables at level, because there is not risk losing information. As Sims (1980) indicated, the importance is that the terms of error are stationary even that the variables are not. So it has tested the stationarity of error.

4.1 - Results

The results of OLS models are shown in Table 01. In relation to the first model, the variable profit is negative and statically significant at level of 1%, which means that the relation between profit share and inflation is inverse. The two lags of inflation were introduced into specification to cut off a possible source of residual correlation across the time. In the second model, the variable profit is positive and statically significant at level of 1%, suggesting that the Brazilian economy has profit-led properties. We added three lags of utilizing capacity installed to correct the residual correlation across the time. The LM test point to no residual correlation, while the test Doornik-Hansen suggested that the residuals follow a normal distribution. The F-test indicated that the variables are significant. The ADF, ADF-GLS and KPSS tests of unit root suggested that residuals of model 01 and model 02 are stationary and, therefore, there is no evidence of spurious correlation.

Table 01- Results of OLS estimations

Model 01 (Inflation)				Model 02 (Utilized Capacity)			
Parameters		Regression		Parameters		Regression	
Profit	-0,02** (0,01)	R^2_{aj}	0,67	Profit	0,08*** (0,01)	R^2_{aj}	0,86
Inflation (t-1)	1,05*** (0,12)	F(3,34)	42,99 [0,00]	Utilized Cap (t-1)	0,43*** (0,10)	F(4,32)	66,09 [0,00]
Inflation (t-2)	-0,46*** (0,09)			Utilized Cap (t-2)	-0,004 (0,09)		
		Doornik-Hansen	4,99 [0,08]	Utilized Cap (t-3)	-0,16*** (0,06)	Doornik-Hansen	2,62 [0,26]
intercept	0,03 (0,07)						
		LM (4,30)	1,36 [0,27]	intercept	-0,01 (-0,08)	LM (4,28)	2,07 [0,11]

Notes: * significant at 10% level; ** at 5% level; and *** at 1% level. The variance is shown between brackets.

The VAR's estimations are shown in Table 02[5]. The tests LM and Ljung-Box suggest that there is not serial correlation. The additional lag guarantees that the errors are normally distributed (Toda and Yamamoto, 1995). The VAR's roots are in the unit circle, hence, the system is stable. The tests ADF, ADF-GLS and KPSS of unit root suggest the stationarity of residuals of three equations of the VAR's system.

Table 02- VAR's Estimations

Sims (1980)		Toda and Yamamoto (1995)	
Equation 01			
R^2_{aj}	0,59	R^2_{aj}	0,69
F(3,36)	19,26 [0,00]	F(6,32)	15,19 [0,00]
LM	5,46 [0,24]	LM	5,19 [0,26]
Ljung-Box	5,87 [0,20]	Ljung-Box	3,32 [0,50]
Equation 03			
R^2_{aj}	0,75	R^2_{aj}	0,73
F(3,36)	36,31 [0,00]	F(6,32)	17,53 [0,00]
LM	7,21 [0,12]	LM	2,72 [0,60]
Ljung-Box	5,85 [0,21]	Ljung-Box	6,05 [0,19]

Source: Estimations

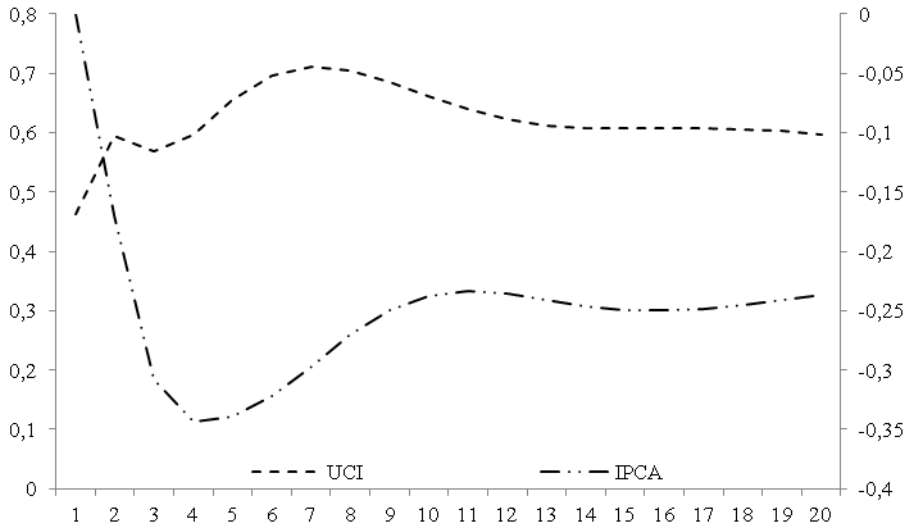
The IRF's results of inflation and rate of utilizing installed capacity from a shock of one standard deviation in profit are shown in Graph 01, the results are in line with OLS output – which suggests robustness of estimations. The response of variables is described below:

i- Rate of utilizing installed capacity (left-handle Scales): it increases until the first quarter, followed by a decrease that reverts in a positive dynamic until the seventh quarter, from this point the rate of utilizing installed capacity stabilizes.

[5] As we focused on impacts of income's distribution in inflation and utilizating of installed capacity, the equation 02 was omitted.

ii- Inflation (right-handle scale): it decreases until the fourth quarter with an increase between the fifth and tenth quarter, from this point the inflation rate stabilizes.

Graph 01- IRF of Rate of utilizing installed capacity (UCI) and Inflation (IPCA) of a Shock (one standard deviation) in Profit



Source: Estimations

The variance decomposition is shown Table 03 (appendix A). At the first moment, the inflation rate is not explained neither by profit or rate of utilizing installed capacity. However, in the course of time, these variations have been explaining the shocks on inflation (in tenth quarter: 42.2% and 17.8%; in twentieth: 53.7% and 15.6%) respectively the profit and rate of utilizing installed capacity. In the other hand, the rate of utilizing installed capacity is explained sharply by profit (51.52% in first quarter and 76.45% in twentieth) reinforcing the profit-led properties of the Brazilian economy.

5- Conclusions

The aim of this paper was to understand the dynamic of Brazilian economy between 2012 and 2015 using the post-Kaleckian and Rangelian theories. We formulated a model incorporating the index mechanism of minimum wage presents in law 12.312. Our theoretical results demonstrated that Brazilian economy becomes more sensitive in relation to contemporaneous economic growth rate. If the economy doesn't grow at least at the real growth rate of the worker's wage, this create a process of real income transfer in favor of workers. Yet, other possibility is associated with the productivity growth, the law 12.312 requires that productivity has an increasing dynamic over time to maintain the distribution of income unchanged.

Thereby, the consequences of income re-distribution depend on the properties of economics. If the economy has wage-led properties, the conflict distributive is resolved through the real growth of GDP. However, if the economy has profit-led properties, the GPD will decrease, reinforcing the income re-distribution. For that matter, the profit indeed is minor that desired profit by entrepreneurs. The oligopolistic sector enhance the prices. The inflation transfers income of workers to capitalists. In face of current difficulties of workers get the standard basket of consuming and decrease in working capital of companies, the Government increases credit to workers and capitalists, sanctioning the income conflict via monetary expansions. Therefore, the inflation has the false appearance of monetary phenomenon.

The empirical exercise has corroborated the theoretical conclusions. The OLS regressions suggested the Brazilian economy has profit-led properties, meaning that economic growth depends on the functional distribution of income. It is been found a negative relationship between inflation and profit, which indicates that a re-distribution of income in favor to workers (reducing the profit share) increases the inflation. The VAR's results showed that a shock of one standard deviation in profit (re-distribution in favor of capitalists) increases the rate of utilizing installed capacity and decreases the inflation.

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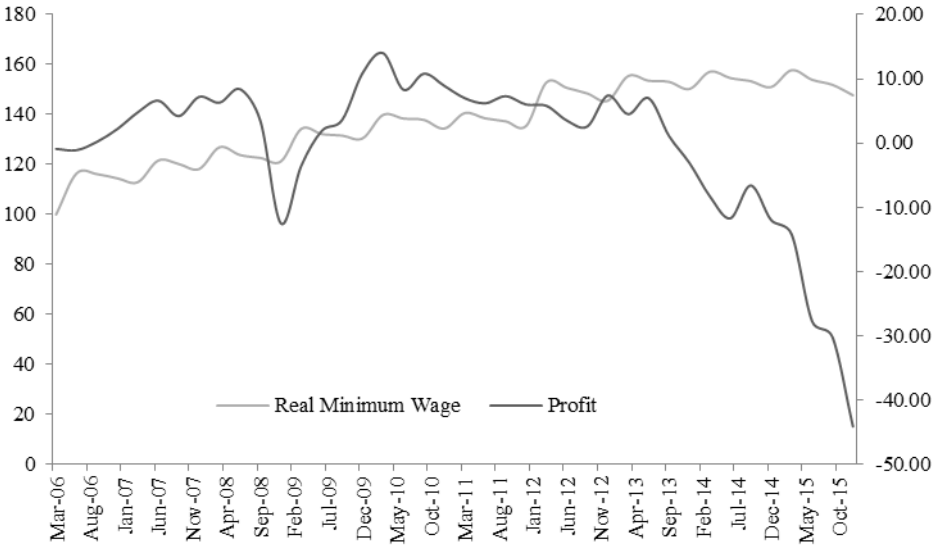
Appendix A: Graphs and Tables

Graph 1- Real Growth of Minimum Wage and Profit

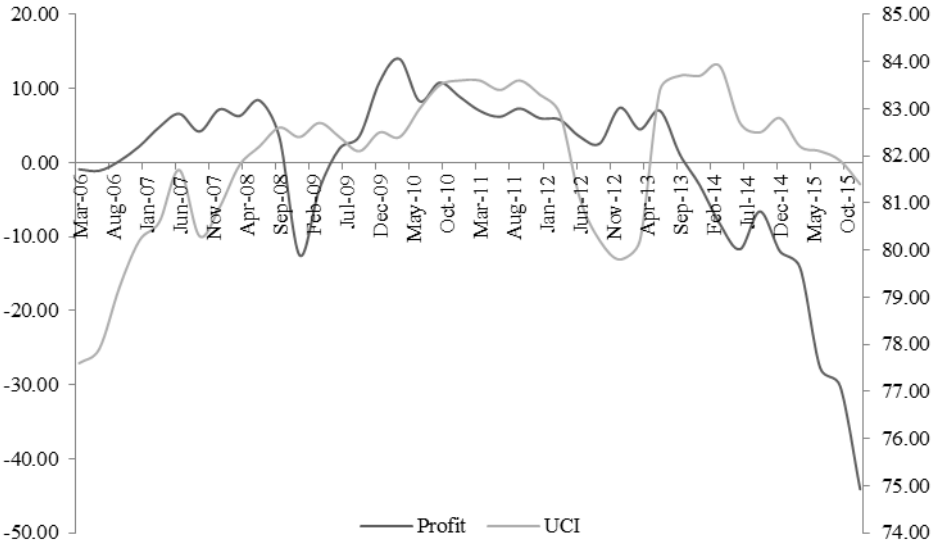


Source: Wage Mass: National Confederation of Industry; Profit: Calculated by authors using the date from the National Confederation of Industry (accessed at: www6.sistemaindustria.org.br/gpc/externo/estatisticaAcessoSistemaExterno.faces); Minimum Real Wage: IPEA (accessed at: www.ipeadata.com.br) both data were accessed on 30/06/2016.

Graph 2- Profit and Inflation

Source: Profit: Calculated by authors using the date from the National Confederation of Industry (accessed at: www6.sistemaindustria.org.br/gpc/externo/estatisticaAcessoSistemaExterno.faces); Inflation: IBGE (http://www.sidra.ibge.gov.br/snipc/tabelaIPCA.asp) both data were accessed on 30/06/2016.

Graph 04- Utilizing of Installed Capacity and Profit



Source: Profit and Utilizing of Installed Capacity: Calculated by authors using the date from the National Confederation of Industry (accessed at: www6.sistemaindustria.org.br/gpc/externo/estatisticaAcessoSistemaExterno.faces); Inflation: IBGE (http://www.sidra.ibge.gov.br/snipc/tabelaIPCA.asp) both data were accessed on 30/06/2016.

Table 03- Decomposition of Variance (Shock in Profit)

Quarter	Utilizing of Installed Capacity			Inflation		
	Inflation	Profit	UCI	Inflation	Profit	UCI
1	0,51	51,52	47,96	100,0	0,0	0,0
2	1,47	67,27	31,26	94,1	5,4	0,5
3	9,97	69,36	20,67	79,1	15,4	5,5
4	17,95	66,95	15,10	64,9	22,8	12,3
5	20,70	65,59	13,71	55,0	28,0	17,0
6	20,01	65,55	14,44	48,9	32,2	19,0
7	18,12	66,33	15,55	45,3	35,4	19,3
8	16,21	67,56	16,23	43,0	38,1	18,9
9	14,65	68,97	16,37	41,4	40,3	18,3
10	13,48	70,39	16,13	40,1	42,2	17,8
11	12,61	71,68	15,71	38,9	43,8	17,3
12	11,97	72,78	15,24	38,0	45,2	16,8
13	11,53	73,67	14,80	37,0	46,5	16,5
14	11,23	74,36	14,42	36,1	47,7	16,2
15	11,01	74,87	14,12	35,1	48,8	16,1
16	10,83	75,27	13,90	34,1	49,9	16,0
17	10,64	75,60	13,76	33,1	51,0	15,9
18	10,45	75,89	13,65	32,2	51,9	15,9
19	10,25	76,18	13,57	31,4	52,9	15,7
20	10,06	76,45	13,49	30,7	53,7	15,6

Source: Estimations

Appendix B: The Computation of Profit

The profit share was caculated through the difference between the nominal revenue and the full costs. Both variables are made avalaible by CNI[6] (National Confederation of Industry) in form of quarterly index, being the first quarter of 2006 the quarter-base. The costs index is based on costs structure of companies with, at least, 30 employes from the PIA[7] (annual publication done by IBGE). Such index accounts with three others index measured by each weight: i- payroll, input (imported and national) and energy; ii- working capital, and iii- taxation.

[6] To obtain more information see www.portaldaindustria.com.br/cni/.

[7] To obtain more informations see www.ibge.gov.br/home/estatistica/economia/industria/pia/empresas/2012/defaultempresa.shtm