Structural change, distributional conflict and inflation inertia in Brazil

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Abstract: The paper focuses some of the long-term non-monetary structural causes of inflationary persistence in Brazil in the post-Real plan period. The paper thus identifies some primary pressures and propagation mechanisms that have imposed a floor to inflation levels. A simple two-sector model is formalized to illustrate that structural changes yield relative price changes that feeds into inflation levels. The persistence of inflation will then depend on the transition path and on the institutional features of the economy. Two forces are taken into account, namely: (i) effects of services-oriented structural change on inflation by way of volatility of relative prices; and (ii) the increase in workers' bargaining power leading to a real increase in the wage share. These pressures combined entail a self-sustaining upward behavior of inflation by way of widespread cost pressures. These forces are then dissipated by specific channels of distributional outcomes, which reinforce the prominence of labor-intensive industries. The weak proneness to innovation in these sectors sets limits to increases in labor productivity; the result is a less flexible productive structure with downward rigidity of prices.

Introduction

In modern macroeconomics, inflation inertia is distinguished from inflation persistence. Inertia refers to the delayed and gradual response of prices to shocks, while inflation persistence refers to prolonged deviations of inflation from steady state following shocks. Much empirical work has been devoted to accounting for both inflation persistence and inertia in Brazil. Figueiredo e Marques (2009) show the existence of inertia in Brazil and detect a long-memory phenomenon embedded in the data-generating process. Tejada e Portugal (2001), Campêlo e Cribari-Neto (2003), Cribari-Neto e Cassiano (2005) e Araújo e Santos (2004) follow the same lines, and attempt to provide quantitative evidence on the effects – both temporary and permanent – of inflationary (or deflationary) shocks on the long run inflation trends in Brazil. Fasolo e Portugal (2003) formulate a nonlinear Phillips curve to the Brazilian economy and conclude in favor of a high persistence of inflation between 1990 and 2002, which is explained by an autonomous inertial component to price behavior.

A persistent downwardly rigid behavior of prices may be related to a variety of causes. The range and intensity of their impact over price trends are connected to how deep-seated in the social structure they are. Amongst these causes, we could mention informational asymmetries and imperfections, indexation of contracts and prices, a permanently expansionary fiscal and monetary policies, changes of economic policy regimes, and the recurrence of systematic random shocks, both internal and external - which in turn make some key macroeconomic prices - such as the exchange rate - more volatile, transmitting transient impacts to prices. A combination of these, and other types, and their systematic occurrence account for inertia and persistence, as modern macroeconomics sees it.

All of the above notwithstanding, index-linking of prices and contracts in Brazil became progressively disseminated throughout the economy since the 1960s and, by the early 1980s, had turned the economy almost entirely dependent upon its automatic nominal adjustment effects.[1] The growing degree of synchronization along the 1980s led policymakers to perceive indexation as the main obstacle to sustained stabilization following disinflation measures. However, the plan was proved unable to provide a complete resolution to this problem; at most, it alleviated the symptom. Concerns over inflation inertia were downplayed following the stabilization attempt in favor of issues regarding exchange rate management and financial capital flight risk. Indexing practices were allowed in specific markets, such as in public and private bond markets and for State-controlled prices of privatized public utilities companies, amongst others, as we have shown elsewhere (CARVALHO, 2014). In 2010, the minimum wage - set by Congress - was linked to one-year-lagged Broad Price Consumer Index and two-year-lagged aggregate output growth.

Available evidence shows that, for almost two decades since the enactment of the Real Plan, indexation has progressively spread across the price structure, and already affects around 24% of the average consumer's bundle of goods in Broad Consumer Price Index (IPCA-IBGE), mostly due to State-supervised prices. (BANCO CENTRAL DO BRASIL, 2012, p. 94-101). Its dissemination can be perceived when goods and services that have automatic adjustment clauses in their contracts are taken into consideration, reaching approximately a 38% share of IPCA-IBGE. (VALOR ECONÔMICO, 2012;

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[1] Further historical background on Brazilian struggle against inflation can be found in Simonsen (1970 and 1995) and Bacha (1999 and 2003) and also on Dutt & Ros (2003).

[2] The Proposed Complementary Act (Projeto de Lei Complementar) 1/2011 reached the Senate in February 21st,

KIRSTEN, 2013).[2] This is not surprising. Afterall, the goal of complete de-indexation could not be accomplished solely by means of provisional measures by the Executive branch of government during stabilization.

Despite the effectiveness of the stabilization attempt in holding inflation down, this social institution owes its survival to the ingrained inflationary memory which in turn reach far back into past decades and are closely related to the country´s socio-economic development process. To these conflict dynamics we can add the disturbing effects of structural changes over relative prices that exert pressures on the price level in the presence of rigidities. This paper seeks to provide a basic analytical framework for the empirical assessment of such forces impinging on inflation levels, instilling in it a self-sustaining thrust. As per our claim, the primary causes are to be found in the undercurrent of structural changes and distributional dynamics. The former refers to pronounced increase in the services sector; the latter is tied to conflicting claims over income, due to institutional developments that respond only partially to market mechanisms and have to do with the rise in bargaining power held by workers.

The pape is divided in four parts beyond this introduction. The second section offers a basic analytical framework based on the Latin American structuralist two-sector model of inflation-feeding changes in relative prices. The third part discusses the connection between structural changes entailed by the development process and the relative price volatility that induces price level variations. The fourth section sets forth a historical account of Brazilian inflation and draws on a host of empirical data to support the claims forwarded. The last section concludes the paper.

A model of structural inflation persistence

We start out by delineating a simple model that will guide us through the empirical data related to inflation patterns in Brazil. Our model follows the Latin American structuralist

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[2] The Proposed Complementary Act (Projeto de Lei Complementar) 1/2011 reached the Senate in February 21st, 2011 and was approved two days later. The Law 12.382/2011, thus approved, established rules for minimum wage adjustments on these lines until 2015. Furthermore, the federal government has effective direct control only over wholesale prices of oil by-products and electricity. In the case of the latter, the State-owned oil company, Petrobras, has been managing the prices of intermediate oil goods in accordance to international prices with varying lag-lengths, in order to prevent a pass-through to price indices. In the electricity market, a new regulatory environment has been designed to push retail prices down. These examples account for some recently raised concerns over Government intervention in the price structure. They point to a rich subject of research. The fact that these events lie in a much too recent past discourages a deeper analysis of its impact on inflation. We will therefore sidestep them without, of course, losing sight of their relevance to our subject.

approach of Julio Olivera (1964; 1967) and Vera (2013), but also benefits from the general conclusions reached by the seminal paper by Rowthorn (1977) and those of a more recent vintage, found in Vera (2005). Drawing on Baumol's (1967) two-sector model, we consider the service sector a non-progressive activity, due to the sector's limited possibilities of reaping sustained gains in productivity. Therefore, in terms of Olivera's (1967) model , demand and supply for the less productive sector varies with time and with the level of relative prices (P_R) between the wage-goods (P_a) and the goods produced by the more advanced sector (P_b).

$$Q(P_R, t) = D(P_R, t)$$

$$\frac{\partial Q}{\partial P_R}\frac{dP_R}{dt} + \frac{\partial Q}{\partial t} = \frac{\partial D}{\partial P_R}\frac{dP_R}{dt} + \frac{\partial D}{\partial t}$$

By multiplying through both sides by $\frac{P_R}{Q}$ and assuming that $Q=D$, after some rearrangements we attain

$$\frac{1}{P_R}\frac{dP_R}{dt}\left[\frac{\partial Q}{\partial P_R}\frac{P_R}{Q} + \frac{\partial D}{\partial P_R}\frac{P_R}{D}\right] = \frac{\partial D}{\partial t} - \frac{\partial Q}{\partial t}$$

and then $\hat{P}_R(\epsilon + \eta) = \delta - \sigma$; hence $\hat{P}_R = \frac{\delta - \sigma}{\epsilon + \eta}$.

From this definition, we can deduce that relative prices depend on the excess demand over available supply as a proportion of the sum of the respective price elasticities of supply and demand ($\epsilon + \eta$). The dynamics of the model goes as follows: $\hat{P}_R = \hat{P}_{a,t} - \hat{P}_{b,t} = \frac{\delta - \sigma}{\epsilon + \eta}$; so that relative prices will change as a discrepancy between rates of change of prices in each sector. The labor market is assumed to have homogenous wages across sectors and varies according to some degree of lagged indexation to the wage-good price, $\hat{w} = (1 - \lambda)\hat{P}_{a,t-1}$, where $0 < \lambda \le 1$ denotes the degree of flexibility of wages to variations in the cost of living, proxied by changes in prices of the wage-goods. For instance, a powerful labor force leads to a diminished flexibility of wages, which is depicted in the model by the parameter λ assuming a value close to zero. As for the price of the progressive goods, it follows a markup-over-cost rule, the cost being defined by labor compensations: $\hat{P}_{b,t} = (1 - \gamma)\hat{w}$, where $0 < \gamma \le 1$ represents the degree of markup flexibility due to market constraints on price rises. For instance, defensive entrepreneurs may entail a strategy of transmitting wage increases to prices, which is

depicted in the model by the parameter γ assuming a value close to zero. As can be seen, the conflict dynamics are to be found in the behavior of the parameters γ and λ. Substituting the wage equation into the progressive good's price equation, we get $\hat{P}_{b,t} = \Lambda\,\hat{P}_{a,t-1}$; $where\ \Lambda=(1-\gamma)(1-\lambda)$. Since $\hat{P}_R = \hat{P}_{a,t} - \hat{P}_{b,t} = \frac{\delta-\sigma}{\epsilon+\eta}$, then

$$\hat{P}_{a,t} = \frac{\delta-\sigma}{\epsilon+\eta} + \hat{P}_{b,t} = \frac{\delta-\sigma}{\epsilon+\eta} + \Lambda\,\hat{P}_{a,t-1}$$

Now, if we apply a one-time lag on the definition above we get $\hat{P}_{a,t-1} = \frac{\delta-\sigma}{\epsilon+\eta} + \hat{P}_{b,t-1}$; thus, $\hat{P}_{b,t} = \Lambda\,\hat{P}_{a,t-1} = \Lambda\left(\frac{\delta-\sigma}{\epsilon+\eta} + \hat{P}_{b,t-1}\right) = \Lambda\frac{\delta-\sigma}{\epsilon+\eta} + \Lambda\hat{P}_{b,t-1}$. Long-run sectional equilibrium rate of inflation is attained for $\hat{P}_{a,t} = \hat{P}_{a,t-1}$ and $\hat{P}_{b,t} = \hat{P}_{b,t-1}$, so that the equilibrium trajectories are given by

$$\hat{P}_b = \left(\frac{\Lambda}{1-\Lambda}\right)\frac{\delta-\sigma}{\epsilon+\eta}$$

and (1)

$$\hat{P}_a = \left(\frac{1}{1-\Lambda}\right)\frac{\delta-\sigma}{\epsilon+\eta}$$

The right-hand side of both equations in (1) is composed of, first, the "structural inflation multiplier" and, second, of "the structural inflation multiplicand". The multiplier depends on the degree of flexibility of both markups and wages: the greater their flexibility (a high value of Λ), the lower is the multiplier. The "multiplicand" is in turn determined by the relative elasticities of supply and demand that dictate how amplified are the pressure on prices arising from excess demand over the supply of the non-progressive sector.

From this schematic framework, a few cases can be outlined. Two extreme cases are those of an absolute inflexibility of wages and markups (Λ =0) and the counterpart perfect flexibility of markups (Λ =1). The former implies a constant structural inflation rate proportional to the tightness of the productive bottleneck ($\hat{P}_a = \frac{\delta-\sigma}{\epsilon+\eta}$; $\hat{P}_b = 0$), whereas the former implies an explosive process leading to a hyperinflation ($\hat{P}_b = \hat{P}_a = +\infty$). The intermediate case ($0 < \Lambda < 1$) is of much interest, for it depicts the high and chronic inflationary process the previously upset Latin American economies for decades.

The conundrum of whether or not there is a relationship between structural inflation and the stages of economic development is still unresolved. However, the performance of price mechanism as an allocator of resources can be assessed by the mobility of factors (or the responsiveness to price differentials among occupations) and price flexibility, which are two features highly regarded in efficient markets. The more pronounced are these characteristics, the higher the values of the parameters γ and λ; hence, more flexible prices are an expected outcome.

Structural change and price-output dynamics

In the process of abandoning a primitive production structure (prone to balanced or unbalanced stagnation or decline) and moving toward a more advanced stage of development, a country is expected to experience a transition process mediated by some speed of economic growth; along with the latter comes the warranted mobility of factors and, thus, relative prices variations; these then prompt rises in the price level. The magnified effects of both the multiplier and the multiplicand of structural inflation are, once again, due to the sluggish factor movements that render the structure of supply rigid. In this sense, some measure of factor mobility with a downward inflexibility of money prices are to be found in changing productive structures. The 1950s and 1960s debate on inflation was largely concerned with the transition from a primitive to a prominently industrial economy. In what follows, we extend the framework to encompass the transition to a tertiarized economy, that is, a productive structure dominated by the services sector.

Two extreme cases can be spelled out under flexible prices, namely: uniform (and symmetrical) flexibility and unidirectional flexibility (OLIVERA, 1964). *Uniform flexibility* is found in a system wherein all money prices have the same speed of response in proportion to the quantity of excess demand in the respective market, and the absolute velocity of response hinges upon the absolute quantity of excess demand, not on the sign of it (hence the *symmetrical* character). The adjustment process is entirely neutral with regard to the general price level, for the upward price movements are exactly offset by the downward price changes. In the second case, the *unidirectional flexibility*, money prices are only responsive to either positive or negative excess

demand. Every relative price adjustment gives origin to a variation of the price level, upwards (downwards) if there exists downward (upward) inflexibility of money prices.[3]

In sum, the structural inflation lurks beneath the conventionally assigned causes of inflation. It can be both a demand-shift and/or a cost-shift inflation, depending on which side of the production structure originates the pressure. Above all, it is worth to emphasize that the effects of relative prices on the price level are ***conditioned*** upon the degree of flexibility of nominal prices; but it is the degree of inflexibility of relative prices that ***determine the magnitude*** of the inflationary change of the money price level.

The adjustment process by which relative price changes take place is also relevant to explain the end result of price levels. It may be a divergent process, whereby prices move away from their equilibrium position and, hence, inflation is explosive; or else, it may take a convergent trajectory. In this latter case, if the adjustment is monotonic, a one-time rise in price levels is observed. Should the adjusting process follow an oscillating behavior, under imperfect downward flexibility of prices, such fluctuations will warrant larger rises in money prices to perform the same adjustment.

The foregoing concepts render one thing certain: the consequences of a relative price variation upon the money price level are not reversible. This means that restoring the previous relative price position will not wipe off the increase in the price level brought about by an alteration of that situation. In fact, a movement trying to reset the previous configuration of relative prices would most likely cause an additional increase in money prices. Thus, if adjustments are carried out in oscillating patterns, the total increase in the latter is bound to be much greater, depending on the amplitude and frequency of the intervening fluctuations.[4]

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[3] Two further comments are due. First, downward flexibility is a sufficient, but not necessary, condition for if the facility of prices to move down is weak, at least in comparison with their responsiveness to upward pressures, there is a strong chance that money price rises – due, for instance, to a shift in demand – will outweigh the price falls, thereby spelling an increase of the price level. Secondly, under the aforementioned conditions, the results hold for whatever causes the relative price change. That includes supply-side-related factors such as a change in the marginal rates of substitution among products or factors, production functions, varying consumer preferences or factor-endowment ratios. They are all bound to exert some pressure on the price level.

[4] The most common frictions Olivera (1964, p. 325, fn 1) refers to are: (1) the tendency to increase nominal wage rates, with a longer of shorter time-lag, to compensate for rises in the cost of living; (2) the tendency to maintain customary wage differentials between different occupations; (3) the tendency to maintain proportionality between prices of manufactured goods and their variable unit costs; and (4) the

From a quantitative standpoint, the total induced increase of the price level has a bearing on the underlying change in the equilibrium value of relative prices. As seen above, this is captured by the "structural inflation multiplier", which purports to convey the inflationary potential inherent in a change in relative prices.[5] Finally, Olivera (1964) offers a fruitful taxonomy for the transition dynamics according to two extrema, namely: an **optimum - balanced growth**: elastic continuous adaptation of the expanding output to the pattern of demand; in this case, the various product markets keep constantly cleared without relative price changes; the optimality refers to the outcome of growth without any concomitant structural inflation; and a **pessimum: unbalanced stagnation or decline**: relative price instability and lack of economic growth; hence, frustration of the growth objective is accompanied by structural price rises.

Output-Price Dynamics	Balanced	Unbalanced
Growth	Elastic continuous adaptation of the expanding output to the pattern of demand; low variability of relative prices. *(1)*	Increase in output, failing to adjust completely to market demand, followed by persistent shifts of relative prices. *(2)*
Stagnation or Decline	Neither growth nor change in relative prices; hence, no structural inflation problem. *(3)*	Decrease in output growth with persistent shifts in relative prices. *(4)*

The transitions are classified according to its neutrality towards relative prices and, consequently, on price levels. The chief concerns point to jump-starting the economy from a balanced or unbalanced stagnant behavior. The process $3 \to 1$ is neutral with regard to the price level. Movement $3 \to 2$ leads to improvements on the side of

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tendency to keep a more or less constant ratio between farm prices and the prices farmers pay for industrial products.

[5] Also, how this change is distributed over time has also significant effects on the stability of prices. Qualitatively speaking, any shift in the equilibrium value of relative prices can push the money price level into one of the following types of sequence, namely: (1) price rises of limited duration, at a decreasing pace; (2) price rise of unlimited duration, at a constant or an irregular pace; and (3) price rise of unlimited duration, at an increasing pace, escalating onto an open hyperinflation.

output but, nevertheless, disturbing as regards price stability. Departing now from the unbalanced decline, the traverse $4 \rightarrow 1$ entails progress in both output and price level objectives is observes, whereas the shift $4 \rightarrow 2$ yields positive outcomes with respect to output, while having either neutral, accelerating, or decelerating effects upon the structural price rises, which will, anyhow, persist under the new set of conditions;

Economic growth is normally accompanied by a greater amount of change than the one observed during stagnation and decline patterns. A growing economy is likely to be subject to wider variations in inter-sectoral terms of trade than it would if it did not grow. However, the facility of relative price adjustments tends to be greater than the one found in stagnant or declining economic environment. In this latter, adaptation of relative prices to new equilibrium data encounters more resistance, for not only a relative, but also an absolute, decrease of real income is taking shape for the affected groups. If these latter hold any degree of controlling influence over prices, the movement of value relations will assume a fluctuating form more likely, with alternated marches towards equilibrium and away from it. On the other hand, a progressively growing economy becomes subject to shifts in relative prices that are compatible with real income increases even for those sectors against which price ratios are varying. In this case, the "multiplicand" of structural inflation tends to be larger and the "multiplier" tends to be lower than under stagnation or decline. (OLIVERA, 1964, p. 329).

Structural changes and distributional imbalances in low-inflation Brazil
It is widely accepted that a low-inflation environment is beneficial to business and hence to economic growth. When it comes to high-inflation experiences, stabilization provides a revival in economic sentiments and enhances the functionality of the productive system. It also entails significant changes in the way the economy works, depending on its previous structure and the way it interacts with international markets in a given historical period.

In many Latin American countries, lasting disinflation rested upon significant balance of payments surpluses, which provided the necessary foreign currency reserves for the accommodation the typical post-disinflation imports-driven consumption boom, under an overvalued exchange rate. Balance of trade plummeted and interest payments on the government debt were thrown in a snowball trajectory. (BASTOS, 2002, chapter 6). However, the literature on the matter held that a fixed nominal exchange rate could

not be maintained under conditions of major fiscal imbalances financed by the creation of domestic credit. Should inflationary pressures exceed the foreign rate of inflation, international reserves would decline, overvaluation of real exchange rate would take over, and a speculative attack on the central bank's foreign exchange reserves likely to occur.

The Brazilian experience – as others alike - ran the full course of the previous train of thought. Disinflation did not mean, therefore, full macroeconomic stabilization. In order to guarantee such outcome, adjustments were carried on throughout the five years that followed disinflation. In this sense, the Real plan entailed a distributional imbalance between two largely defined income groups, namely, those with flexible prices (mainly firms in the tradable and non-tradable sectors) and those with their income defined by periodically revised contractual prices (mainly workers, rents and public utilities).[6] The former group was allowed to freely adjust their prices within the period of synchronization of prices, while the latter had its "prices" defined as a moving average of the previous four months, starting in march 1994, when the URV (in English, Real Value Unit) period began.

Structural changes and inter-sector price dynamics

Figure 1 suggests that some set of dampening forces comes into play to suppress the transmission of producers' price rises to consumers. Note that in 20 years, wholesale prices outpace headline CPI inflation by at least 100%. This is but another dimension of inter-sector distributional imbalances. If wholesale price rises are not transmitted onto consumers' prices, some non-monetary variable has to be adjusting in the downstream sectors, that is, either employment or production levels.

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[6] Bacha (1998) provides a comprehensive discussion of the Real Plan imbalances, especially on the fiscal front.
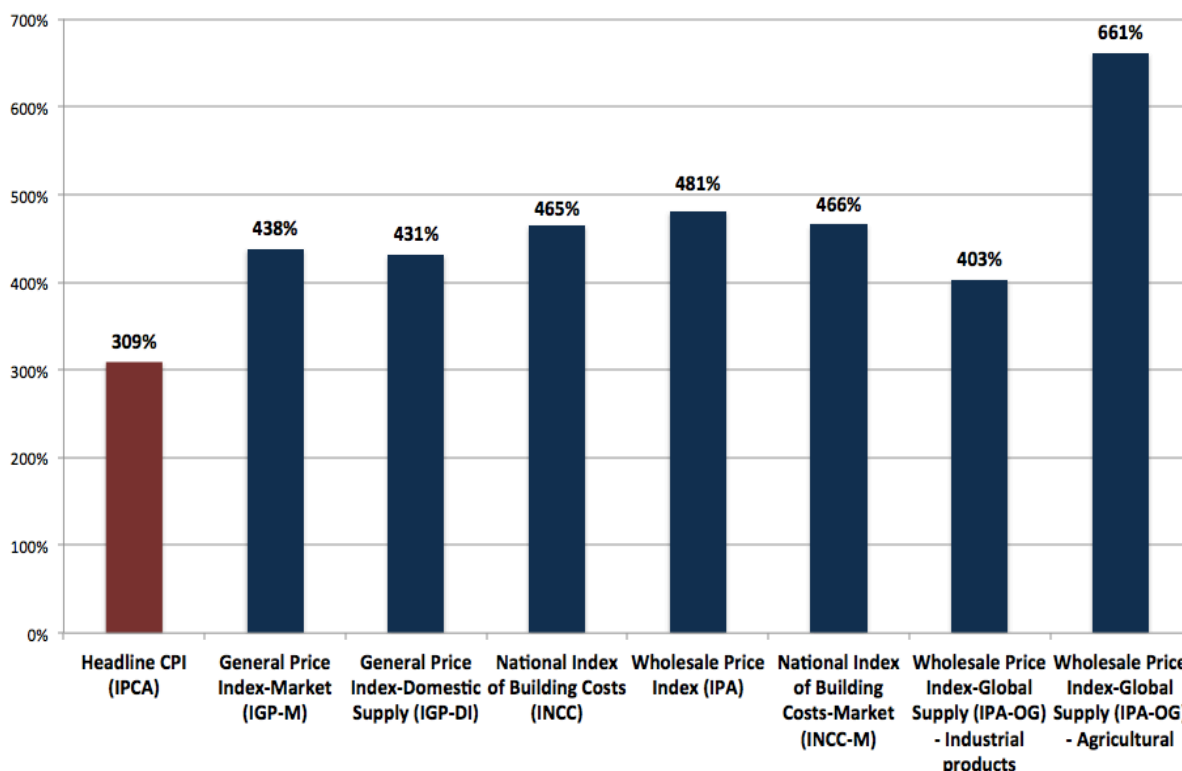
Figure 1 – Headline CPI (IPCA) and Various General and Wholesale Price and Buidling Costs Indices – Accumulated change from july 1994 to june 2014. Source: Central Bank of Brazil.

Data analysis supports the view that de-industrialization has been the chief outcome of such inter-sector distributional dynamics in a context of rapidly changing composition of demand in face of severe rigidities in the structure of supply and of sharp changes in external conditions (ALDRIGHI & COLISTETE, 2013). Escape valves channel cost-shift through rising imports, sustained inflation and soaring credit expansion rates. Institutionalized indexation keeps inflation from surging upwards by prohibiting contracts that foresee inflation-correcting price adjustments with intervals shorter than twelve months. Upon closer inspection of the three main groups of prices in Brazil, it is clear that prices of services outpace industrial prices all along, and that the acceleration of the State-supervised prices stands out after the year 2000 (**Figure 2**).
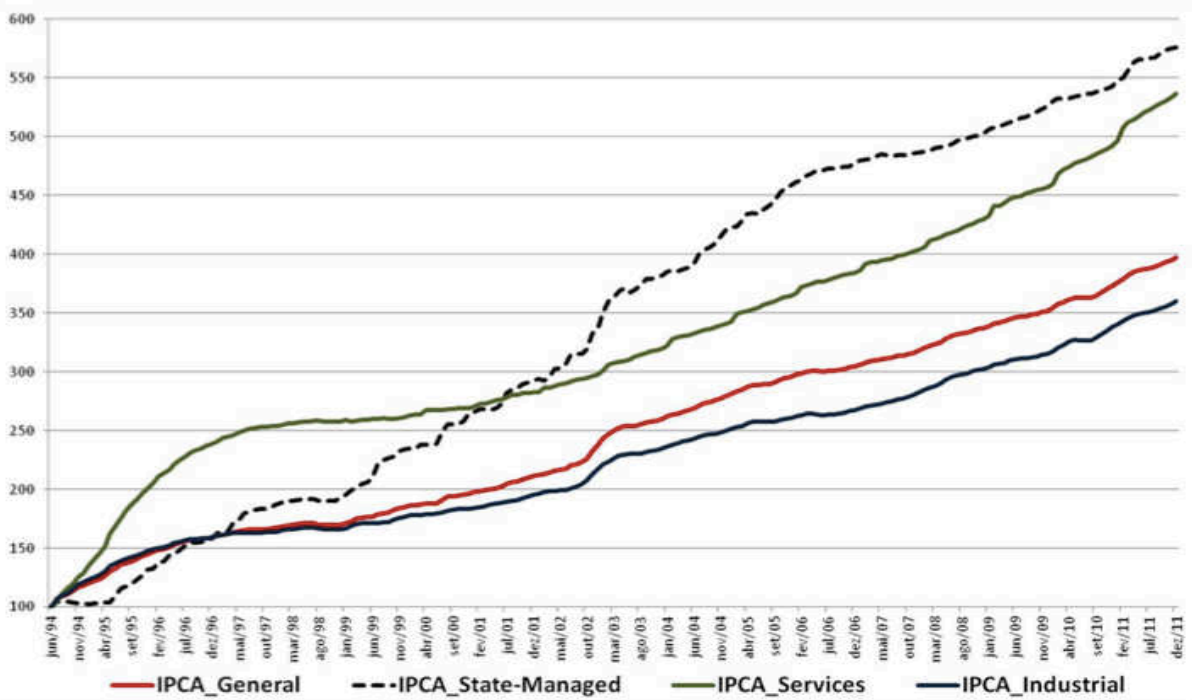
Figure 2 – Headline Consumer Price Index – IPCA-IBGE – sorted by large categories (jun 1994 = 100). Source: Brazilian Institute of Geography and Statistics (IBGE).
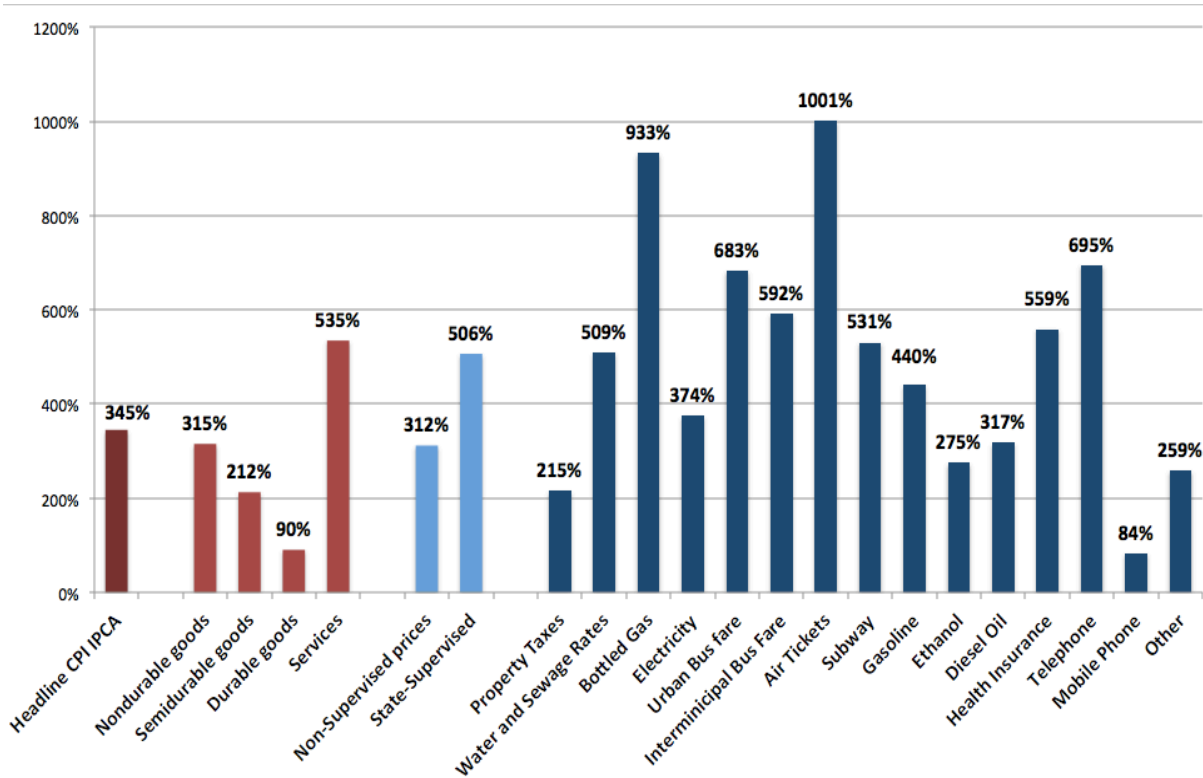

Figure 3 – Accumulated Inflation from July 1994 to December 2013 – sorted by different categories: Headline CPI Inflation (IPCA), Nondurable, Semi-durable, Durable Goods, Services, Non-Supervised vs. State-Supervised Prices and Components of State-Supervised Price Index (*dark blue bars on the right hand side of the chart*). Source: Central Bank of Brazil.

Services and State-managed (supervised) prices have been largely benefited by the recent economic history to the detriment of industrial prices. Additionally, evidence

garnered in **Figure 3** indicates that State-Supervised prices (506% increase) and prices of services (535%) are the period's great victors in the inter-sector distributional struggle following stabilization, between July 1994 and December 2013. [7] State-supervised activities related to public utilities - such as telecommunications, electricity, health insurance, taxes, public transportation etc. - and subject their prices to supervision by government agencies. They are basic inputs of production and thus are likely to act as basic levers of subsequent price increases downstream sectors in the supply chain. As mentioned before, we believe that de-industrialization is the symptom that best fits the phenomenon illustrated by the evidence above, although further evidence is required to support this claim. Be that as it may, a shrinking manufacturing sector tends to shift resources toward labor-intensive production of services (**Figure 4**). Lower productivity scores in the latter implies higher costs and, given overall labor market legal institutions, there emerges a higher tendency to transmit cost rises onto prices.
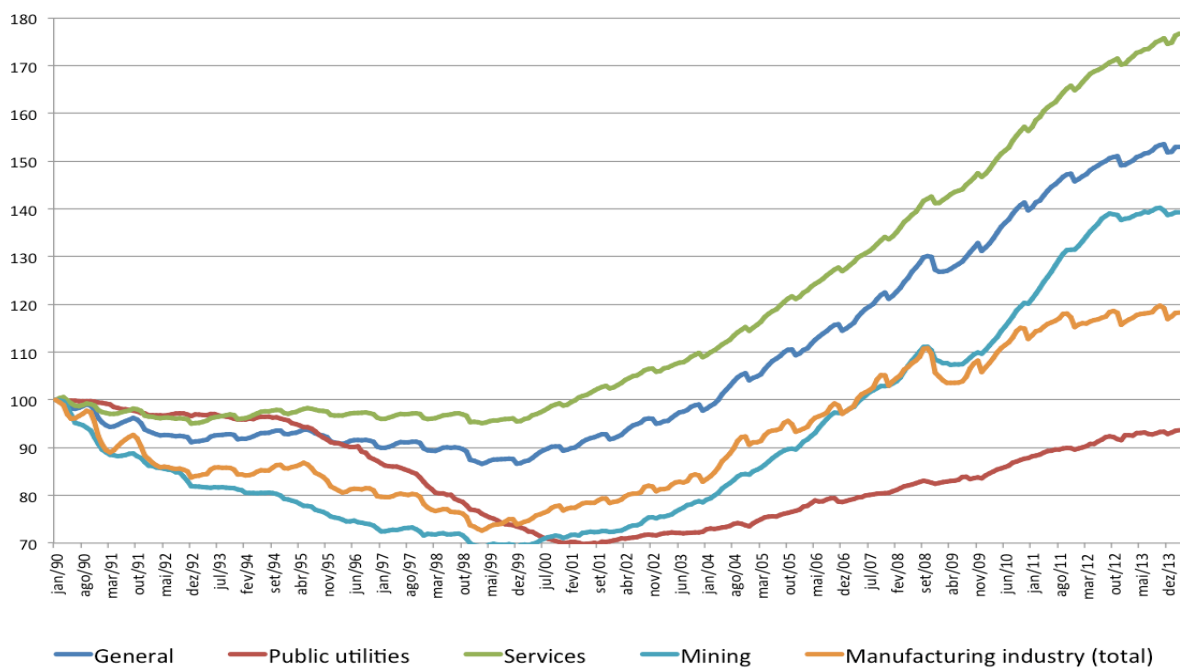

Figure 4 – Formal Employment, by selected aggregate sectors (Jan 1990 = 100). Source: Brazilian Institute of Geography and Statistics (IBGE) – Monthly Employment Survey – past methodology (IBGE/PME antiga).

[7] As regards supervised prices, Franco (2006, p. 251) has noted that the new regulatory environment that resulted from the process of privatization of State-owned companies has induced a change in strategic price behavior on the part of the private companies that acquired the rights to exploit the market potential for public utilities and services. Such companies are suspected of anticipating future revenues through price rises in order to finance investments in future capacity expansion. Given the monopolistic structure of the market for such goods and services, a low price elasticity of demand and regulatory measures endorse such pricing behavior.

Moreover, any level of hidden unemployment (see next section) imposes qualitative restrictions on the nature of newly created job opportunities. Thus a greater share of the labor force is pushed onto tasks characterized by lower productivity - at least, when it is compared to industrial-sector economies of scale. **Table 1** illustrates this job allocation pattern. Note that non-registered labor reaped an increase of 200% in average real earnings from September 2001 to December 2013, with both registered and self-employed lagged behind changes in average earnings perceived by overall occupied people. Non-registered labor is connected to temporary contracts (which may involve both skilled and unskilled labor) and underemployment (such as house maids, retails sales persons, private security personnel and so forth).

Occupied People	Registered	Nonregistered	Self-employed	Private Sector	Public Sector
132%	124%	200%	99%	148%	175%

Table 1 – Accumulated Change Real Average Earnings, sorted by type of labor contract and by sector (private or public), from September 2001 to December 2013. Source: Author's calculations based on the Monthly Employment Survey (new methodology) - Brazilian Institute of Geography and Statistics (IBGE).

In sum, there are two primary upward pressures lurking beneath Brazilian inflation. The large effect that prices of services exert over the price index is explained by the de-industrializing trend that concentrates job-creation on the services sectors, which display lower elasticity of supply due to sluggish productivity increases, as is expected of these industries. Second, there is the self-sustaining pressure arising from the State-managed price changes. Both have an auto-regressive component built in their price setting behaviors. This downwardly rigid price behavior is explained by the widespread indexation that runs rampant in the economy, as stated previously, which can be either formally stated in contracts or informally practiced by backward-looking price-setters. Additionally, the public utilities companies present pricing strategies that, given their upstream location in the price structure and the infrastructural nature of their activity, tend to impose a floor to price adjustments by firms positioned downstream in the production process. These are, however, slow-moving phenomena. Their effects take time to be captured by the array of economic indicators that inform economic policy and, given that conventional theory to a large extent establishes what is to be measured and how to interpret the data, this underlying chain of causation tends to go unnoticed. And yet, this supply side explanation warrants further explanation of what prevents the autoregressive effect from vanishing through time. To do that, we

must turn now to the propagation mechanisms associated with non-market mechanisms, i.e. the conflicting claims over aggregate income.

Distributional imbalances and conflicting claims

A structuralist conflict approach is distinguished from monetarism or general orthodox models in that wages do not respond entirely to market conditions. Workers also depend upon their bargaining power with respect to firms and the government (PALLEY, 1996). The compelling message brought by the conflict approach is the tracing out of the distributive effects among capitalists and workers in different sectors. Such dynamic aspects are hard to frame by use of econometric analysis, given the presence of feedback processes and varying lagged effects among explanatory and dependent variables. Nonetheless, a few indicators allow us to depict the conflict dynamics in Brazil for the period under analysis, namely: (1) increase in formal employment and its implication in terms of the unionized share of workers; (2) the cost-of-living adjustments of wages (minimum and otherwise); and (3) a rapidly increasing wage share as proportion of GDP.

Therefore, if workers' compensations are partly exogenous due to non-market factors such as institutional detail or interference by government authorities, economic policy that relies on market mechanisms is likely to turn partially ineffective. Furthermore, it can end up harming the economy to greater extent than immediate results allow one to grasp. For instance, a conventional policy may fail to anchor agents' inflationary expectations by way of demand-contracting policy, if independent forces keep pushing up costs. The defensive behavior taken by firms is to translate such costs surges into price rises, as portrayed by the conflict approach. Expectations will soon incorporate such cost-push rises, despite monetary authorities' communication efforts to coordinate them. **Figure 5** depicts the rise in unemployment as capacity utilization of industry increased in the years following disinflation. Setterfield (2006) recognizes diminishing workers' secutirity as an effective anti-inflation policy in the United States in the 1970s and 1980s. A similar trend is found in Brazil in the immediate post-disinflation period, wherein the employment rate and the informality degree bore the adjustment in distribution of wealth and income (see **Table 2**), increasing de degree of workers' insecurity.
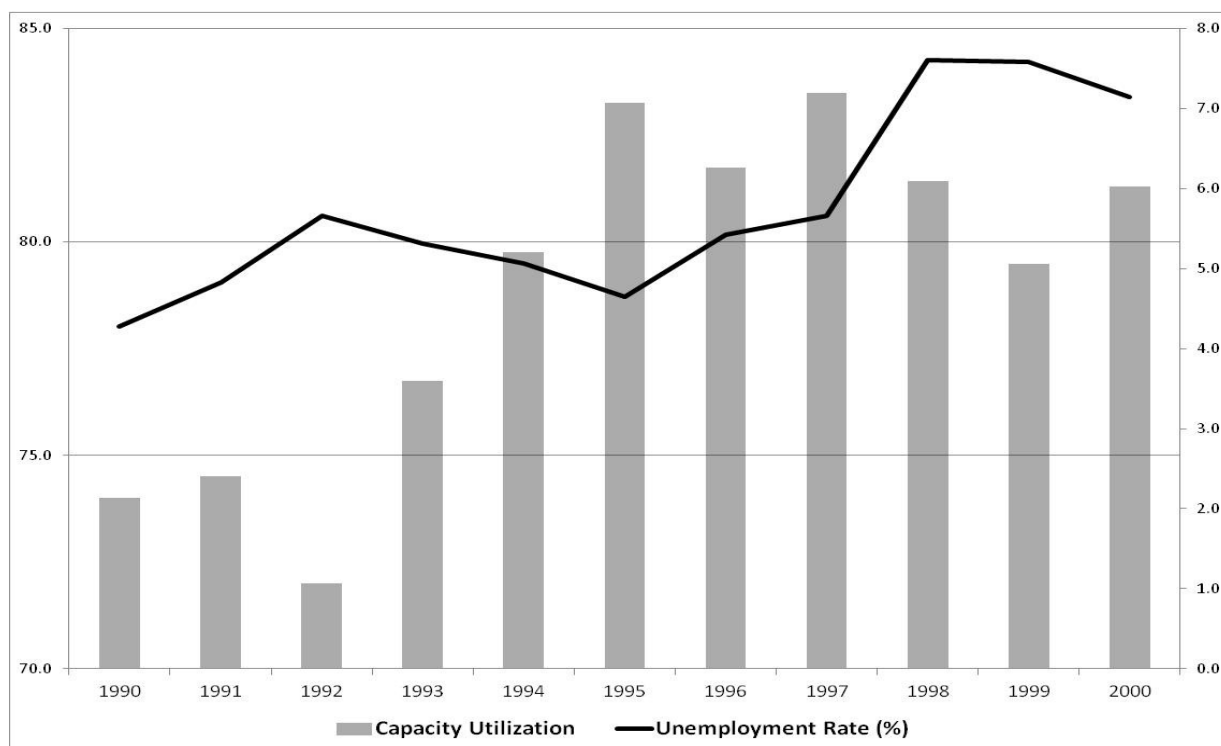
Figure 5 - Rate of Utilization Capacity (%) and Unemployment rate (%) – 1990-2000. Source: Fundação Getúlio Vargas (Capacity Utilization Index) and Brazilian Institute of Geography and Statistics (IBGE) (Unemployment Rate).

Date	General	Metropolitan areas	Non-Metropolitan areas	Rural areas	Urban Non-Metropolitan areas
1992	56.4	40.6	63.8	83.4	55.8
1993	57.2	41.5	64.6	82.7	57.2
1995	57.8	43.7	64.8	82.2	58.0
1996	57.8	44.7	64.2	80.7	58.3
1997	58.0	44.9	64.4	81.6	58.1
1998	58.8	45.6	65.1	81.6	59.0
1999	59.6	47.8	65.3	81.0	59.4
2001	58.1	48.5	62.9	83.2	57.4
2002	58.2	49.0	62.7	83.0	57.5

Table 2 – Degree of Occupation Informality – Definition 1 – 1992-2002. Source: Institute of Applied Economic Reasearch (IPEA).[8]

These indicators shed light on a single instance of non-monetary imbalances that outlived the Real plan. Needless to say, they ran counter to the ultimate goal of a

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[8] Obs.: "Definition 1" adopts the following methodology of calculation: (informal employment + own business) / (formal employment + informal employment + own business). Elaboration: Disoc/Ipea.

mutually neutral coordination of individuals' plan of action from an intertemporal distributive point of view. In static terms, an increase in unemployment is an effective approach to ensure a progression of wages that is compatible with the economy's distributive structure. However, when unemployment is enforced in the midst of a stabilization process, it most likely will inflict a greater wedge between desired and effective levels of income and consumption. As a result, a future restoration of the bargaining power by the labor force will potentially be followed by a rapid "excess" increase in wages over prices. This "excessive" advance of wages will trigger a defensive response by firms, which will transmit cost-push forces to prices (in our baseline model, parameters γ and λ will decrease), thus rendering prices inflexible downwards; hence the non-neutral intertemporal effects of the Brazilian stabilization attempt, however low inflation was maintained in the years that followed disinflation. **Figure 6** depicts the upward trend in formal employment and with the counterpart decrease in informal jobs. This points to an increase in labor's bargaining power.
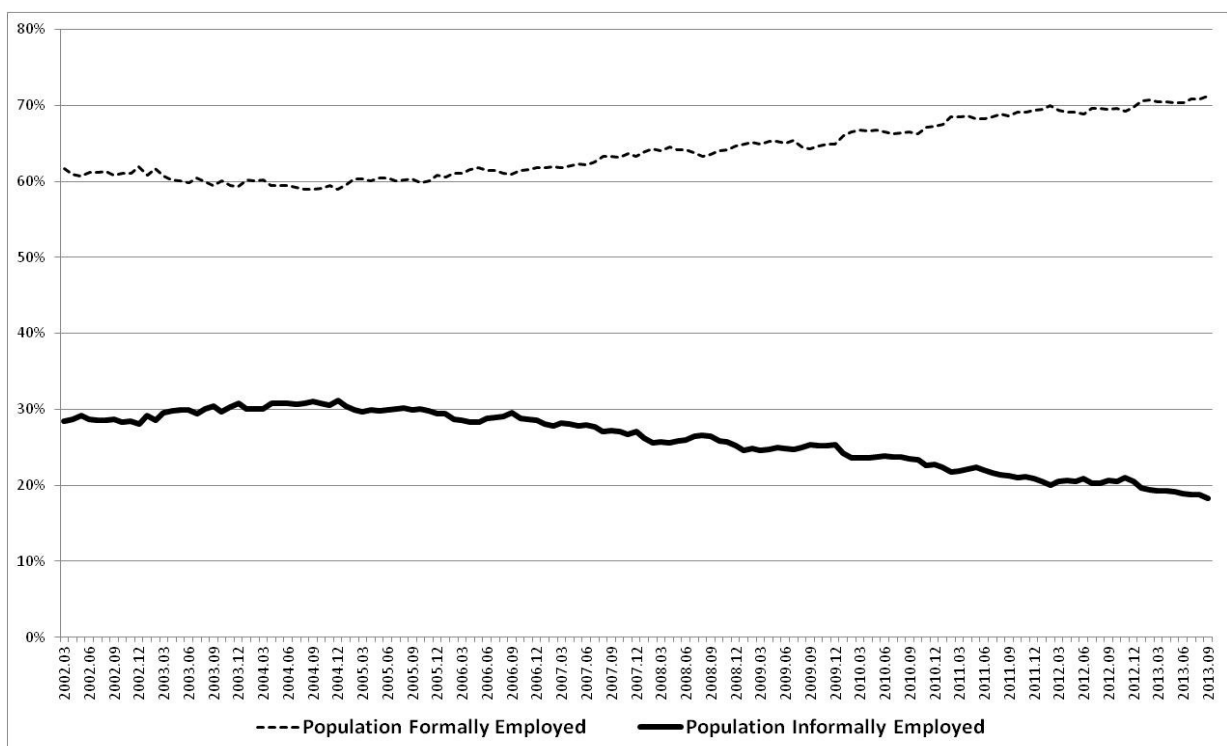

Figure 6 – Share of formal and informal employment – March 2003-September 2013. Source: Brazilian Institute of Geography and Statistics (IBGE) – Monthly Employment Survey – past methodology (IBGE/PME antiga).

As regards wage negotiations, many labor categories had wages lag behind inflation for many years (MOLLO & SAAD FILHO, 2001), which generated a repressed gap between desired and effective wages. The external sector bonanza between 2004

and 2008 shifted bargaining power in direction of workers. From 2005 until 2010, no less than 72% of the categories managed to have wages vary above inflation, as measured by the National Consumer Price Index. If we add to this figure those categories that were successful in adjusting per inflation, around 90% of them managed to maintain or increase real wages – in 2006 and 2007, respectively, only 3.1% and 4.1% of categories had adjustment rates below inflation. (DIEESE, 2011, p. 3). Analysis accounting for inter-sector differences indicates widespread above-inflation adjustments of wages can be observed. In 2010, manufacturing, services and retail sectors managed to achieve a 90% share of adjustments equal to or above inflation (97.4%, 92.8% and 96.6%, respectively), in contrast to lower shares in 2008 (93.9%, 80.3% and 92.1%, respectively). (DIEESE, 2011, p. 5). Workers' bargaining power has thus increased in steady fashion throughout the late years 2000 (**Figure 7**). Workers faced progressive loss in bargaining power a few years after disinflation, as seen in the decrease in the number of strikes from 1997 and 2003, when increasing rates of unemployment raised workers' insecurity and demobilized labor unions through increasing flexibilization of labor markets regulations.
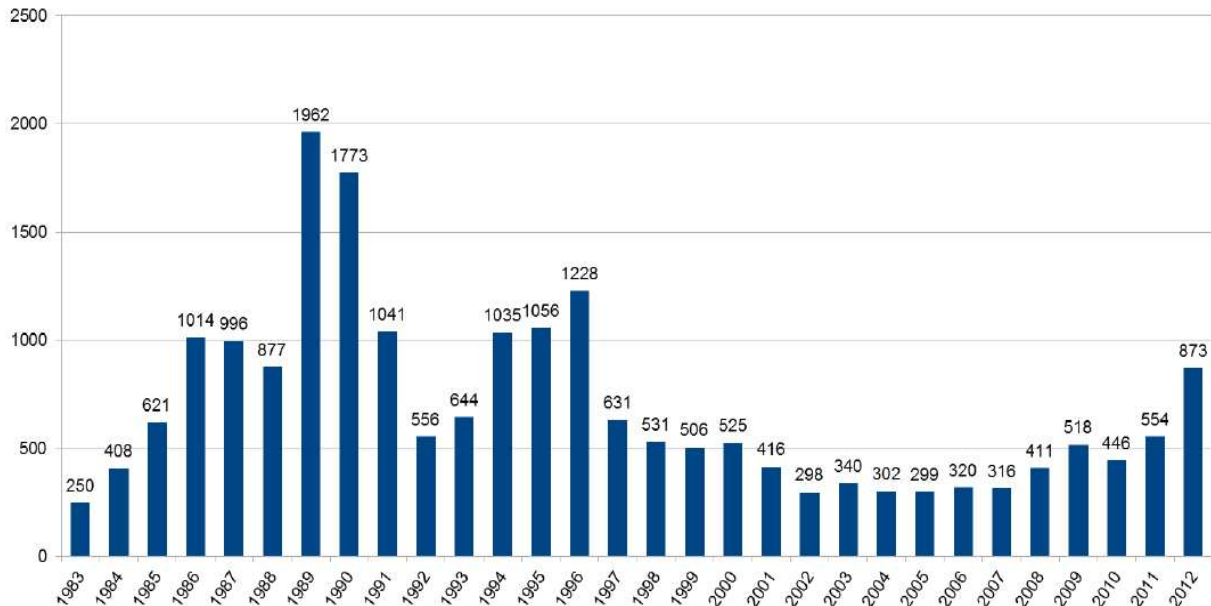

Figure 7 – Number of Strikes per year – 1983-2012. Source: DIEESE (2012, p. 33) – Inter-Union Department of Statistics of Labor – Strikes Monitoring System– (SAG-DIEESE – Sistema de Acompanhamento de Greves).

A shift took hold between 2004 and 2008, when the Labor Party (*Partido dos Trabalhadores, PT*) led by President Luis Inácio Lula da Silva focused on raising employment, reducing job insecurity. Minimum and average wages increased above

inflation with a slightly changing number of strikes. This can be explained by the acceleration of output growth in this period, driven by the Asia-led international growth, which allowed for a seemingly stable resolution of conflict over income. Minimum wage policy was particularly progressive in Lula da Silva's terms in office.[9]

A further connection can be made out between the real-exchange-rate/wage ratio (**Figure 8**). From 1994 until 2003, exchange rate depreciation offset increases in wages, as the decrease in unit labor costs line reveals. From 2004, the domestic currency appreciation joined forces with the "exogenous" minimum wage policy. If we bring relative prices back into the analysis, yet another inkling is revealed by the data. Note that differentials between non-tradable and tradable prices are correlated with the headline inflation up until 2004. From this point on, the broad consumer price index tends to outpace relative prices. Not surprisingly, that is when the increasing wage share takes over income growth, leading to higher unit labor costs that affect both tradable and non-tradable goods producing sectors, thus decelerating the rise in relative prices between them.
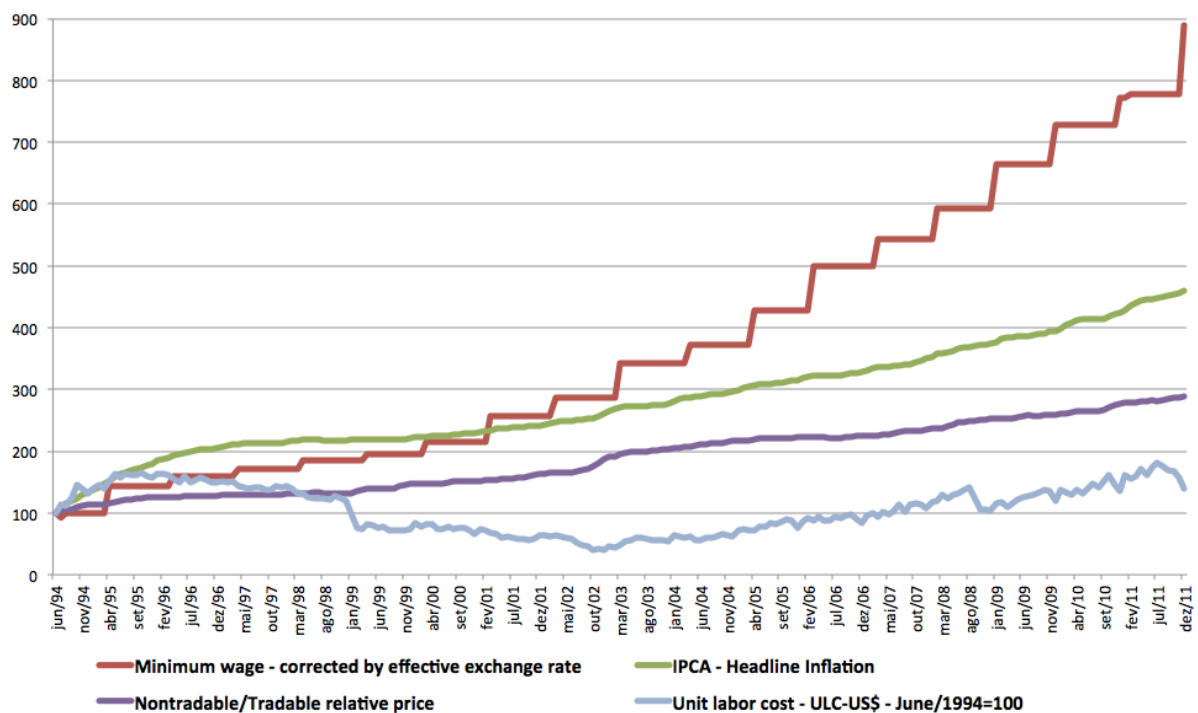

Figure 8 – Minimum wage corrected for effective exchange rate, headline Inflation (IPCA), Nontradable/tradable relative prices and unit labor costs. (June 1994=100).

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[9] For a further discussion on redistributive policies in Brazil and its connection to growth see Lisboa & Latif (2013). For an analysis with a wider scope on Latin America, see Teichman (2008).

Wages have steadily gained terrain in the functional distributional dispute over income. The rise in the wage share overlaps the period of systematic exchange rate appreciation and increase in unit labor costs (see **Figure 9**). As unemployment rates started to hit historical lows halfway along the 2000's decade, the wage share has increased more steadily in detriment of profits. In this framework, each social group awaits favorable conditions to restore previous real income levels, as it is commonly seen in conflicting claims stories, as the one set forth by Braga (2010). From this viewpoint, a decrease in profits provides disincentive to investment and innovation, especially in the face of high costs entailed by the Brazilian infrastructure framework, State expenditures obligations coupled with a dysfunctional tax structure and still lagging educational indicators (HAUSMAN, 2008). Nonetheless, it is striking that the previous period (2001-2004), when profits increased more sharply, does not account for a boost in innovative activities and productivity. Quite the contrary, manufacturing sectors have face tremendous difficulties in keeping up with the type of services-dominated growth dynamics the above evidence shows for the case of Brazil. When social conflict over income is not mediated by labor saving innovations that feed into productivity increases, consistency of the system is restored by way of inflation, deterioration of current accounts results, increase in debt obligations – eventually a spur of nonperforming outstanding debt contracts - both in private and public sectors.
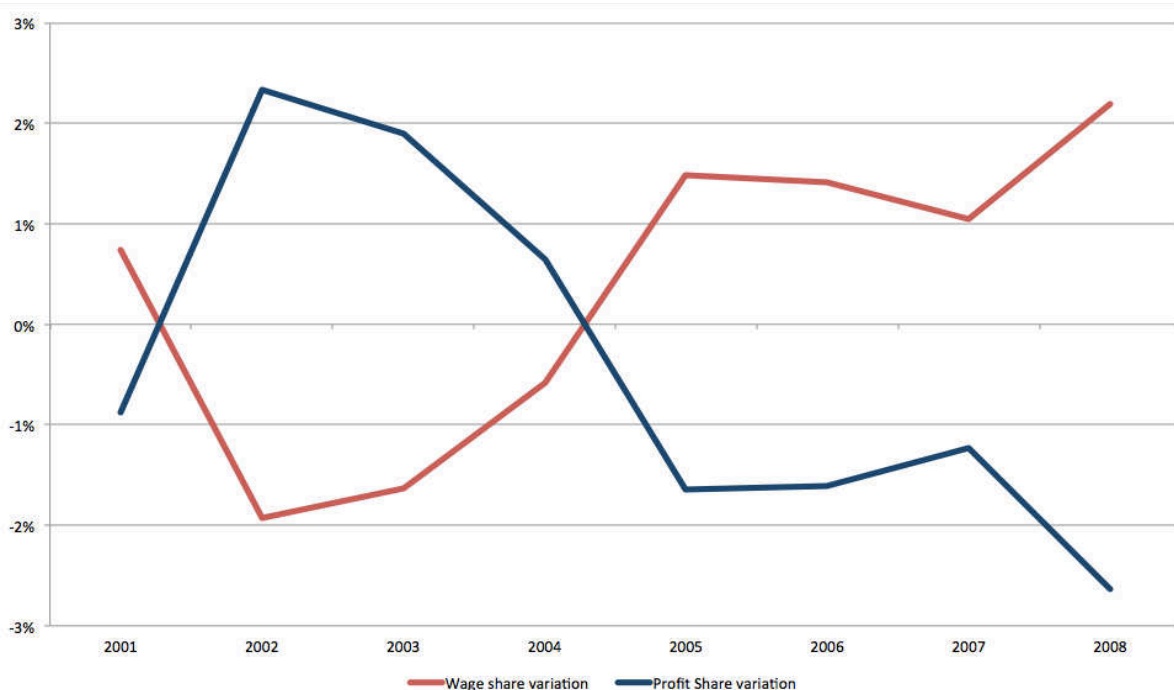

Figure 9 – Year-on-year percentage variation in wage and profit shares of income in Brazil (2000-2008). Source: Brazilian Institute of Geography and Statistics (IBGE).
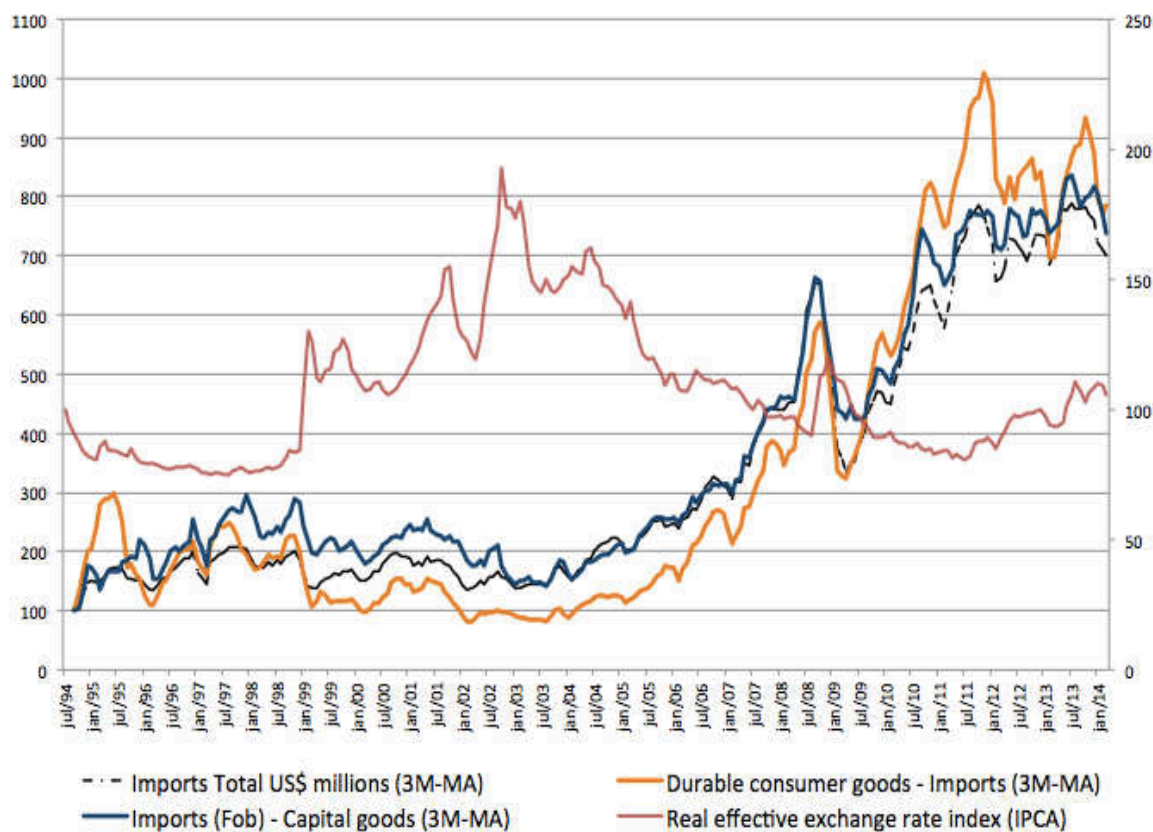
Figure 10 - Total Imports, Capital goods imports, durable consumer goods imports and real effective exchange rate (corrected by Broad Consumer Price Index-IPCA): three-month moving average – (July/1994=100). Source: Central Bank of Brazil

Under the pressure of an appreciating real exchange rate, wage costs are surged upwards whilst market prices are pulled down by competition with imports (**Figure 10**). Demand requirements are met via imports, especially in the capital and durable consumers goods, indicating the ever more compressed share of manufacturing in the productive structure. Thus, as income grows and becomes less unevenly distributed, aggregate demand composition directs resource allocation away from comparatively more productive sectors, such as manufacturing.

Moreover, Government-sponsored policies of income distribution and labor-empowering institutions culminated in a sustained increase in the wage share, abetted by the downward movement of exchange rates and a foreign exchange bonanza bolstered by the upswing in the international trade of commodities. Employment rates surged upward and reinforced workers' bargaining power. A protracted policy of real increases in minimum wage (see **Figure 11**) and the institutionalized wage indexation to past inflation and two-year lagged real output growth both acted to diminish the sensitivity of labor to economic conditions. On the other hand, there are market factors

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to be considered. The systematic decrease of hidden unemployment in São Paulo Metropolitan Aerea, the largest city in the country, suggests that market forces are also in play. However, this does not outstrip the main thrust of our story. Quite the contrary, the overheating of the economy that was boosted by the international commodity prices boom reinforces the structural changes alluded to in the previous section. In equations (1), this translates into an increase in the second term on the right-hand side, the structural inflation multiplicand $\left[\dfrac{\delta-\sigma}{\epsilon+\eta}\right]$; the question as to what combination of changes among the four elements drive this behavior remains open to further empirical research.
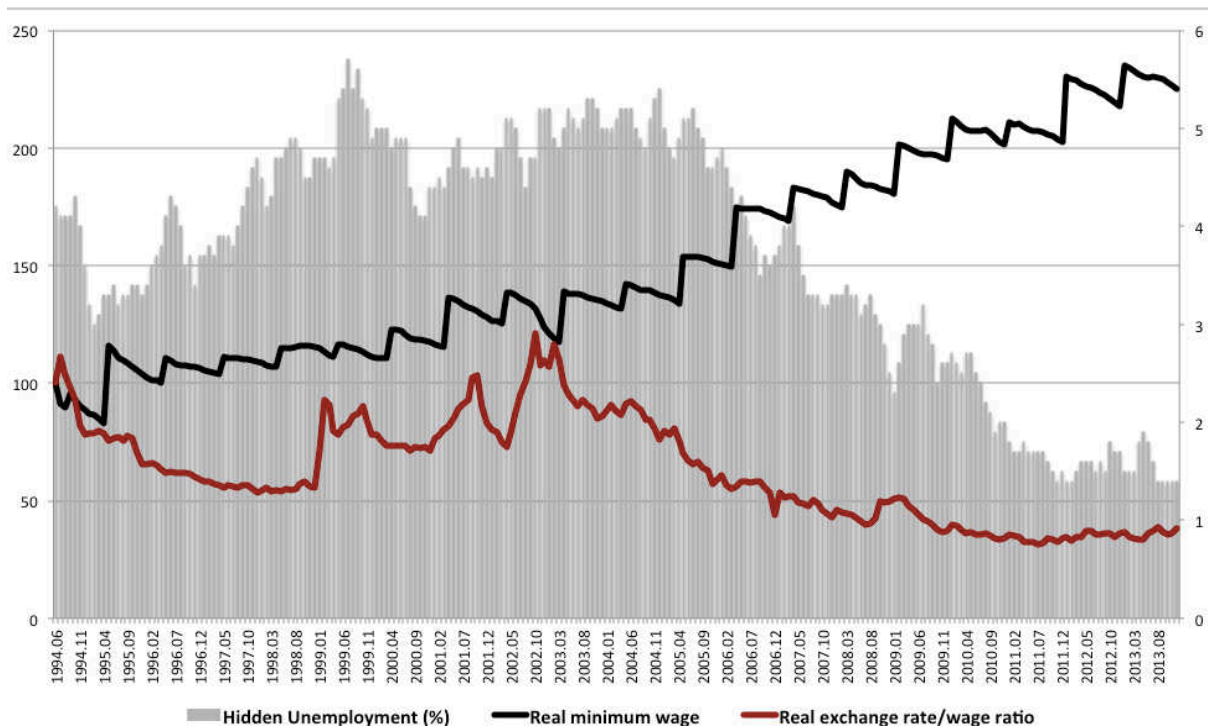

Figure 11 – Hidden Unemployment Rate in São Paulo Metropolitan Area (left scale), Real Minimum Wage and Real Exchange Rate/Wage Ratio (right scale - June 1994=100). Source: Ipeadata.

Concluding remarks

The paper offers an account of the self-sustaining behavior of inflation in Brazil in the period following the stabilization plan in 1994. We draw on a two-sector model analytical framework in the Latin American structuralist tradition to understand the effects of structural changes on output-price dynamics. In this line of reasoning, structural changes lead to relative price changes that feed into inflation rates. A balanced growth trend reflect a high level of activity with rather stable relative prices, whereas an unstable stagnation is the pessimum state, for large swings in relative prices result from a dwindling growth rates, yielding staflationary patterns.

Upon this analytical frame, empirical evidence is provided. Our findings point to the presence of downward rigidity in price adjustments due to services-oriented structural changes that have reduced the elasticity of supply in the economy and, secondly, an enhaced bargaining power held by workers in the early 2000s. The former is explained on the basis of an inter-sector distributional struggle that has favored prices of both services and State-supervised industries to the detriment of manufacturing activities. The so-called de-industrializing trend that has been frequently alluded to in recent Brazilian policy debates appears to be the outcome of such conflicting claims among productive sectors. An ensuing unidirectional upward flexibility of prices in the service and state-supervised sectors are further infused by increasing costs arising from labor market changes and currency appreciation.

The strengthening of labor has in turn drawn a cyclical pattern. Stabilization partly rested on increased unemployment levels and workers' job insecurity. As the international commodities boom picked up in the early 2000s, output growth boosted employment levels while government-sponsored redistributive measures rapidly raised standards of living of the lower brackets of the income scale. The effects of a revival in workers' aspiration-seeking behavior and of sustained real minimum wage increases were emboldened by an appreaciating currency, yielding a sharp increase in the wage share of aggregate income.

Outside the conflicting claims framework, such measures can be easily misconstrued as set of arbitrary measures of an inflation-friendly government within the realm of central banking "good practices". Quite a different picture emerges if the process of rising standards of living is understood as a disequilibrium process. In this analytical scheme, structural and institutional changes trigger defensive reactions by social groups attempting to maintain or increase their share of the real income. "Calculations" guided by fairness considerations within the distributive conflict determine the intensity of dispute over real income. The discerning question seems to be how far back in time should the "relevant period" stretch in order to better inform the behavior of claimant groups. This decision will determine the gap between desired wage levels and the effective average wage level within the selected period for each economic group. It is true that the factors influencing agents' and groups' perceptions regarding "distributional fairness" are too numerous to occupy us here. Nonetheless, they transcend market mechanisms and are subject to institutional, structural and

political forces. When such behavior is aimed at periodically restoring previous real income levels, conflict is said to be stable and inflation rises constantly but moderately (VERA, 2013). But, if groups entail a dispute for rising shares of real income, the conflicting claims culminate in the acceleration of inflation, which can ultimately lead to an explosive process. Fortunately, this is not the case for Brazil, as we have seen. Rather, conflicting claimants have found a way to circumvent the fully inflationary mechanism of adjustment by way of rising imports of products from other economies. The alternative found has aggravated a previously ongoing process of de-industrialization. And this has reduced the elasticity of aggregate production by dislocating volumous resources to sectors that are labor-intensive and face limits to the speed and effectiveness of innovative behavior.

Therefore, the paper has shown that there are cost-shift elements that are not sensitive to demand-management measures. (At least, not to the extent that these are claimed to be optimal measures). These structural and institutional elements are likely to engender downward inflexibility of prices, demanding costly policy measures to break their resistance. In this sense, our story tried to show that a minimum rate of inflation – or an "unavoidable rate of inflation" – hovering above those found in developed countries might be the necessary adjustment during a transition from an industrial economy to a mature services-oriented productive structure. How long such a change may take and if it will ever achieve maturity is an open question. More pressing is the question of whether Brazil has been living an unbalanced stagnation, which tends to generate persistent stagflation; or if the country is but facing a slowdown in an otherwise balanced path of expansion. Either way, inflation seems not to be a cause of these problems, at the level it has taken hold, but a symptom of the economic structure and institutions of the country.

References

ALDRIGHI, Dante; COLISTETE, Renato Perim. (2013) *Industrial Growth and Structural Change: Brazil in a Long-Run Perspective*. Department of Economics FEA-USP – Working Paper, Nº 2013-10.

ARAÚJO, Eurilton, SANTOS, Tatiana Teles. *A dinâmica da Inflação Brasileira após o Plano Real* In: Insper Working Paper, WPE 054, IBMEC: São Paulo, 2004, p. 1-32.

BACHA, Edmar. (1998) *O Plano Real: uma avaliação* In: MERCADANTE, Aloizio. O Brasil pós-Real: a política econômica em debate. Campinas, SP: UNICAMP. IE, 1998, p. 11-70.

BALTAR, Carolina T. (2013) *Economic growth and inflation in an open developing economy: the case of Brazil*. (PhD Dissertation) University of Cambridge – Darwin College.

BANCO CENTRAL DO BRASIL. Relatório de Inflação. Brasília, v. 14, nº 2, jun. 2012, p. 1-143.

BANCO CENTRAL DO BRASIL. Relatório de Inflação. Brasília, v. 13, nº 1, mar. 2011, p. 1-151.

BASTOS, Carlos Pinkusfeld. (2002) *Price stabilization in Brazil: a classical interpretation for an indexed nominal interest rate economy*. (PhD Thesis) - New School of Social Research, NY, March.

BAUMOL, William T. (1967) *Macroeconomics of unbalanced growth: the anatomy of urban crisis*. **The American Economic Review**, v. 57, n. 3 (Jun.), p. 415-426.

BRAGA, Julia de Medeiros. (2010) C*onflito Distributivo e Inflação no Brasil: uma aplicação ao período recente*. In: Salvador Vianna; Miguel Bruno; André Modenesi. (Org.). Macroeconomia para o Desenvolvimento: crescimento, estabilidade e emprego. Brasília: Ipea, 2010, v.4, p. 119-156.

CARVALHO, Andre Roncaglia (2014). *A persistência da indexação no Brasil. **Brazilian Journal of Political Economy**, v*ol. 34, n. 2 (135), April-June.

CAMPÊLO, A. K.; CRIBARI-NETO, F. *Inflation inertia and 'inliers': the case of Brazil*. Revista Brasileira de Economia, v. 57, n.4, p. 713-719, 2003.

CRIBARI-NETO, F.; CASSIANO, K. *Uma análise da dinâmica inflacionária brasileira*. Revista Brasileira de Economia, v.59, n. 4, p. 535-566, 2005.

DIEESE (2011). *Balanço das negociações dos reajustes salariais em 2010* In: Estudos e Pesquisas, nº 55 – março de 2011. Disponível online: www.dieese.org.br . Acesso em 19.05.2011.

_____ (2012). *Balanço das greves em 2012* In: Estudos e Pesquisas, nº 66 – maio de 2013. Disponível online: www.dieese.org.br . Acesso em 19.06.2013.

FIGUEIREDO, Erik Alencar, MARQUES, André M.. *Inflação Inercial como um Processo de Longa Memória: Análise a partir de um Modelo Arfima-Figarch* In: Estudos Econômicos, São Paulo, v. 39, n. 2, abril-junho de 2009, p. 437-458.

FREITAS, P.S., MINELLA, A., RIELLA, G. *Metodologia de cálculo da inércia inflacionária e dos efeitos do choque dos preços administrados*. Notas Técnicas do Banco Central do Brasil, Brasília, n. 22, jul-2002, p. 1-14.

FRANCO, G.H.B. (2006) Crônicas da convergência: ensaios sobre temas já não tão polêmicos. Rio de Janeiro: Topbooks Editora.

HAUSMANN, R. (2008) *In Search of the Chains that Hold Brazil Back*. Harvard Center for International Development, Working Paper 180, 2008.

KIRSTEN, José Tiacci. *A indexação está de volta na classe média*. Informações FIPE, agosto de 2013, p. 13-14.

LISBOA, Marcos de Barros; LATIF, Zeina Abdel (2013). *Democracy and Growth in Brazil – revised version.* Insper Working Paper, WPE: 311/2013.

MAIA, A.; CRIBARI NETO, F. *Dinâmica inflacionária brasileira: resultados de auto-regressão quantílica*. Revista Brasileira de Economia, v. 60, n. 2, p. 153-165, 2006.

MOLLO, M. L., SAAD FILHO, Alfredo. *Reconhecimento social da moeda: observações sobre a inflação e a estabilização de preços no Brasil* In: Revista de Economia Política, v. 21, n.2 (82), abril-junho/2001, p. 24-42.

OLIVERA, J. H. (1964). *On Structural Inflation and Latin-American 'Structuralism*. Oxford Economic Papers, Vol. 16, N° 3, pp. 321-332.

OLIVERA, J. H. G. (1967): "Aspectos dinamicos de la inflaci6n estructural", Desarrollo Económico.

Palley, T. (1996) Post Keynesian Economics: Debt, Distribution and the Macro Economy (New York: St. Martin's Press).

ROWTHORN, Robert (1977) *Conflict, inflation and money*. Cambridge Journal of Economics, v.1, n.3, p. 215-239.

SETTERFIELD, Mark.(2006). *Balancing the Macroeconomic Books on the Back of Workers*. International Journal of Political Economy, 35(3): 46-63

SIMONSEN, M. H. (1970). *Inflação: Gradualismo x Tratamento de Choque*. Apec, Rio de Janeiro.

_____.(1995) 30 anos de indexação. Rio de Janeiro: Editora FGV.

TEICHMAN, Judith (2008). *Redistributive Conflict and Social Policy in Latin America*. World Development. Vol. 36, No. 3, pp. 446–460.

TEJADA, C.; PORTUGAL, M. (2001) *Credibilidade e inércia inflacionária no Brasil: 1986-1998*. Estudos Econômicos, v. 31, n. 3, july-september, p. 459-494.

VALOR ECONÔMICO. (2012) Indexação ainda afeta 38% da inflação. Reportagem de 06/07/2012. Online. Disponível em: http://www.valor.com.br/brasil/2740704/indexacao-ainda-afeta-38-da-inflacao#ixzz228MjwydB. Access on July 7th 2012.

VERA, Leonardo. (2005)*. Can recession feed inflation? a conflicting claims framework.*Review of Political Economy, Volume 17, Number 4, 1–19, October.

VERA, Leonardo (2013). Inflación estructural redux. Ensayos Económicos, 69, Deciembre.