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Keywords: cyclical profit squeeze; Brazilian economy; profit rate decomposition; Weisskopf; structuralist Goodwin model

JEL Codes: B50; B51; E32.

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Output and profit cycles in Brazil (1996-2016)

Guilherme Klein Martins
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Between 2014 and 2016, the Brazilian economy collapsed. After more than ten years of rates of economic growth above the recent historical average, real gross domestic product (GDP) fell almost 10 percent from its last peak, in the first quarter of 2014, to the most recent trough, in the last quarter of 2016. Unemployment rate, in its turn, more than doubled, surging from 6.2 to 13.7 percent between December 2013 and March 2017. The present paper aims to contribute to recent debates on the origins and

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determinants of such collapse. To do so, we resort to an empirical investigation of the cyclical trajectory of the profit rate in Brazil throughout the last five business cycles, from 1996 to 2016, following closely the framework established, in this *Journal*, by Weisskopf (1979). The present work, which uses extensively the results obtained by Martins (2017), is part of an ongoing research project that attempts to interpret the recent Brazilian economic trajectory from the standpoint of growth and distribution models (Carvalho/Rugitsky, 2015; Rugitsky, 2015, 2016, 2017; Gonçalves, 2017).

To the best of our knowledge, this is the first attempt to apply the part of Weisskopf's (1979) framework that focuses on the cyclical phenomena to data from countries other than the United States (U.S.). The rarity of this kind of research is probably due to the difficulty to obtain data for profit rates in a frequency adequate to examine cyclical dynamics. Most studies on profitability rely on annual data and, as a consequence, focus on longer-term trends.[i] Taking advantage of data made recently available (Souza Júnior, 2017), the present research computed a quarterly profit rate series from 1996 to 2016.

The results obtained seemed illuminating due to its contrast to the ones obtained for the U.S. economy, by Weisskopf (1979) himself and by subsequent research (Henley, 1987; Bakir and Campbell, 2006, 2009, 2017; Izquierdo, 2013). These investigations have suggested that a cyclical profit squeeze is one of the main determinants of cyclical dynamics in the U.S., with the expansion phase of each cycle bringing about a squeeze in the profit rate that eventually unleashes the contraction phase. In general, such pattern does not seem to apply to Brazil, being hard to identify profit squeezes in its data. As a peripheral economy dependent on the exports of primary goods, the end of the expansion phases of its cycles seems to be generally brought about by foreign shocks. It

is also noteworthy that its cycles tend to be shorter, with expansion phases that are not long enough to heat the labor market sufficiently for profits to be squeezed: the U.S. economy went through only 4 cycles between 1980 and 2009 and their average length was more than 7 years (28.9 quarters), whereas the Brazilian economy went through 7 cycles between 1983 and 2009 and their average length was less than 4 years (14.9 quarters).[ii]

The fact that cycles in peripheral economies are exogenously determined is, of course, an old theme from Latin American structuralism. A recent examination of this issue by the Economic Commission for Latin America and the Caribbean (ECLAC), resorting to data for 59 countries from 1990 to 2010, found similar results (ECLAC, 2012: chap. 3)[iii]: the average duration of cycles is shorter in Latin America and the Caribbean than in other regions, like East Asia and OECD member countries (ECLAC, 2012: 101). Moreover, it is noteworthy that the difference is explained mainly by the contrasting duration of the expansion phases of the cycles, with contraction phases being more homogeneous in their duration across regions. The Brazilian case is singled out in this analysis due to the fact that the expansion phases of its cycles, in this period, were even shorter and had smaller amplitude than the Latin American average. ECLAC (2012: 100-1) argues that such "truncated expansion phases," characteristic of the region, are "determined by external shocks (particularly in relation to access to international liquidity and terms-of-trade fluctuations) and procyclical policies."

The last cycle of the Brazilian economy, however, shows a pattern similar to the one identified in the research for the U.S. economy. In the third quarter of 2010, some quarters into the expansion phase, the profit rate peaked and started to decline. Then,

after a long period of profit squeeze, the contraction phase began in the first quarter of 2014. It is plausible that the magnitude of the collapse that followed can be, at least partly, attributed to the fact that it was the compounded result of a foreign shock (as previous contractions) with the heightened distributive conflict produced by the profit squeeze. As it will be suggested below, such profit squeeze, an uncommon occurrence in the Brazilian economy, was probably allowed by the commodities boom.[iv] It is suggested from this recent history that, when foreign bonanzas allow the Brazilian economy to grow for periods longer than usual, it becomes subject to the cyclical profit squeeze dynamics that seems to be typical of rich economies.

1. CYCLICAL PROFIT SQUEEZE: THEORY AND HISTORY

The usefulness of Weisskopf's (1979) framework can be more clearly suggested by presenting it alongside certain growth and distribution models.[v] In 1967, Goodwin suggested that Volterra's predator and prey model could be used to represent Marx's interpretation of the business cycle. More concretely, he conceived a framework in which growth and the functional distribution of income would determine each other, leading to cycles in employment and the wage share. The impact of distribution on growth resulted from assuming: (i) that, following Kalecki, there are savings only out of profits; (ii) that savings automatically become investment (Say's law); and (iii) that the capital/output ratio is stable. Goodwin (1967: 54) claimed that the last assumption was of "an empirical sort" and admitted that it was "disputable", while the first two were made "for convenience." It follows from the three assumptions above that a higher profit share raises the savings rate and, consequently, the investment rate. Faster accumulation of capital, in its turn, leads to faster economic growth (the two rates must

be equal in order to keep the capital/output ratio constant). Resorting to current jargon, one could argue that this formulation was the equivalent, in a savings-driven model, of a profit-led growth regime.

The other side of the model consisted in the impact of growth on distribution. This resulted from the assumption that real wage "rises in the neighbourhood of full employment" (1967: 54). When output growth is faster than labor productivity growth (he assumed the latter grew at a constant, exogenous rate), employment increases, strengthening the bargaining position of the workers, pushing real wages up, and squeezing the profit share (once real wage growth is faster than labor productivity growth). One could call this inverse relation between growth and the profit share a profit-squeeze distributive schedule (following Barbosa-Filho and Taylor, 2006). Putting everything together, the result would be a cyclical trajectory. When employment is low, real wages grow less than labor productivity, increasing the profit share and accelerating output growth. Such growth would increase employment until real wage growth surpassed the growth of labor productivity, squeezing profits. The resulting lower profit share cuts down capital accumulation and ends up decreasing employment. Eventually, the weakened bargaining position of workers is reflected in lower real wage growth and the profit share recovers, reinitiating the cycle.

Briefly put, Goodwin (1967) formalized a cyclical profit squeeze, based on the periodical depletion and reconstitution of the reserve army of labor, providing a mathematical representation of an argument elaborated by Marx (1867/1976: chap. 25). For the purposes of the present paper, it is useful to consider the implications of

Goodwin's (1967) cycle for the trajectory of the profit rate, decomposed in the way suggested by Weisskopf (1979: 342):

$$\rho = \frac{\Pi}{K} = \frac{\Pi}{Y}\frac{Y}{Z}\frac{Z}{K} = \sigma_\pi \varphi \zeta$$

where ρ stands for the profit rate, Π is the volume of profits, K is the capital stock, Y is output, and Z is potential output (that is, output produced at full utilization of productive capacity). In this way, the profit rate can be decomposed in three elements, the profit share of income (σ_π), the capacity utilization rate (φ), and the capacity/capital ratio (ζ). Given that Goodwin (1967) assumed a stable capital/output ratio, he disregarded the trajectories of the utilization rate and the capacity/capital ratio (which, when multiplied, result in the output/capital ratio). It follows that his profit share cycles are also profit rate cycles.

Barbosa-Filho and Taylor (2006) formulated a version of Goodwin's model that essentially entailed the incorporation of the principle of effective demand.[vi] They called it a "structuralist Goodwin model." Instead of output growth, in their model it is the capacity utilization rate that interacts with distribution to generate cycles. Correspondingly, the cycles are in utilization (instead of employment) and the wage share.

The main novelty of their model lies in the impact of distribution on utilization[vii]. Abandoning Say's law, they assume that output is determined by effective demand and that the latter, in its turn, is a function of income distribution. Assuming a higher propensity to consume out of wages than out of profits, a higher profit share decreases

consumption, but it also has a positive impact on investment. Depending on the parameters, a direct or an inverse relation can result between the profit share and utilization. The former case is called the profit-led demand regime, while the latter is the wage-led one.[viii] Based on data for the U.S., they argue that the profit-led case is the most relevant one and focus their discussion on it. This option entails that the cycle that emerges from their model is similar to Goodwin's (1967), except for the role played by effective demand.[ix]

Regarding the cyclical trajectory of the profit rate, however, Barbosa-Filho and Taylor's (2006) model goes beyond Goodwin's in a significant way. The cycles in the capacity utilization rate, which result from their model, imply that the assumption of a stable capital/output ratio is abandoned – precisely the one that Goodwin admitted was disputable. The reason is that, as shown in Weisskopf's (1979) decomposition of the profit rate, the output/capital ratio moves along the utilization rate, assuming that changes in the latter are not compensated by changes in the capacity/capital ratio. Consequently, the structuralist Goodwin model's cyclical dynamics of the profit share and of utilization tend to result in more complex profit rate cycles. Dividing the trajectory in four phases, one can summarize their results in the following way:

(A) Starting from a low capacity utilization rate, both utilization and the profit share increase, the former due to increasing demand (a result of the above-average profit share) and the latter due to slack in the labor market (the other side of low utilization). Rising utilization and profit share both increase the rate of profit.

(B) The previous increase in utilization results in a tight labor market, with real wages growing above labor productivity and, consequently, squeezing the profit share. Given that the profit share, despite starting to fall, is close to its highest level in the cycle, demand is still increasing and bringing about further increases in utilization. The trajectory of the profit rate depends on the relative strength of the two forces that are pushing it in opposite directions (a falling profit share and a rising utilization rate).

(C) The third phase is the beginning of the contraction. The previous decrease in the profit share becomes large enough to reduce aggregate demand and utilization. Due to the fact that the latter, despite falling, is still close to its peak, workers remain with a strong bargaining position to further squeeze the profit share. The profit rate decreases in this phase, with the simultaneous fall of the profit share and utilization.

(D) The fourth phase is the final part of the contraction. It is characterized by the gradual recovery of the profit share, an effect of the fall of utilization that began in the previous phase and that resulted in a working class weakened by rising unemployment. Given that the profit share, despite starting to increase, is close to its lowest level in the cycle, demand is still falling and bringing about further decreases in utilization. Once more, the trajectory of the profit rate depends on the relative strength of two forces that are pushing it in opposite directions (a rising profit share and a falling utilization rate).

Such models allow one to identify determinants of the cyclical dynamics of growth and distribution in capitalist economies, combining explanations for the trajectories of capital accumulation and of the distributive conflict between capital and labor. But mechanically applying them to illuminate specific historical episodes may lead to

misleading results. Weisskopf's (1979) empirical strategy allows one to examine the data of specific cycles from the standpoint of the models discussed above, but it also helps to assess whether particular cyclical trajectories deviated from the one predicted by the models.

Weisskopf (1979) himself thought of his framework as destined to evaluate empirically different variants of Marxian crisis theory, that is, the different Marxian explanations for the law of the tendential fall in the profit rate. Those explanations are usually associated with the long-run phenomena, but Weisskopf (1979: 341) argued that they could also be considered as theories "of short-run cyclical declines in the rate of profit (to explain capitalist business cycles)." With the data available to him, he examined both long-run and short-run dynamics.

Only the part of his work concerning cycles is of interest for the present research. It began by dividing each of the five cycles that the U.S.' economy went through between 1949 and 1975 in three phases, as suggested by the fact that, in each cycle, the profit rate peaked before output. The first phase, designated phase A or early expansion, was dated from the trough of real output to the peak of the profit rate. Phase B, or late expansion, began at the peak of the profit rate and ended in the peak of real output, while phase C, also called contraction, lasted from the peak of output to its subsequent trough. With this division, he estimated the change in the profit rate (and in its components[x]) in each phase of each cycle and then averaged the results obtained for the same phases of all cycles.

Very briefly, the results he obtained were the following. The profit rate increased in phase A, in the average for the 5 cycles, due to increases in the profit share and in utilization. Then, in the late expansion (phase B), a profit (rate) squeeze was the result of a falling profits share, which more than compensated the modest increase in utilization. Finally, during the contraction (phase C), the profit rate was further brought down by an additional decrease in the profit share and by a decline in utilization. The trajectory of the capacity/capital ratio did not have much impact on the profit rate in any phase of the cycle[xi].

Weisskopf's (1979) results can be seen as an empirical vindication of the structuralist Goodwin model for the U.S. economy. The trajectories observed on phases A and B are the ones predicted for the first two phases of the demand and distribution cycles, described above (the ones indicated precisely by A and B). And Weisskopf's (1979) results complement the theoretical description by pointing out that in the late expansion the decline in the profit share more than compensates for the increase in utilization, resulting in a squeeze in the profit rate. Weisskopf (1979: 350) opted for not dividing the contraction in two phases and so his phase C should be read as the combination of the two contraction phases of the theoretical cycles described above (the ones referred to as C and D).

The present paper is an attempt to contribute to the sparse efforts that make use of the approach developed by Weisskopf (1979) – like Henley (1987), Bakir and Campbell (2006, 2009, 2017), and Izquierdo (2013), all of them focused on updating the framework for the more recent U.S. cycles – and to analyze whether his results are valid for other periods or for other economies, especially peripheral ones. It should be

mentioned as well that the present research is also related to other attempts to interpret the current Brazilian crisis by focusing on the trajectory of the profit rate, like Rocca and Santos Jr. (2014), Marquetti, Hoff, and Miebach (2016), Pinto et al. (2016), and Martins (2017).

2. OUTPUT AND PROFIT CYCLES IN BRAZIL (1996-2016)

Data for the five cycles examined is presented in Table 1 and Figure 1, below. Details about sources and the method for computing the profit rate, as well as its decomposition, can be found in Appendix 1. It is remarkable that cycles I and IV do not have phases B (late expansions), as they were defined by Weisskopf (1979), given that output and the profit rate peak at the same quarter. In cycle II, in its turn, the profit rate peaks one quarter before output, but, given the inherent imprecision in the dating of cycles, this short profit squeeze should be interpreted with caution. In cycle III, the profit rate peak coincides with the initial trough, so that the entire expansion is characterized by a decline of the profit rate, following its sharp recovery in the last quarter of the previous contraction. In this case, there is no early expansion (phase A), but only the late one (B), in Weisskopf's (1979) terms. Finally, cycle V has the three phases well defined, being reminiscent of the U.S. cycles.

It should be noted that attempts to update Weisskopf's (1979) work to more recent U.S. data also found a cycle without phase B, the one between 1980 and 1982.[xii] The latter is usually explained as an expansion cut short by Volcker's contractionary monetary policy, so that it did not last long enough to significantly impact the labor market and, through this impact, to result in a profit squeeze (Brenner, 1998/2006: 194-198).[xiii]

[TABLE 1 AND FIGURE 1]

Is there a similar explanation for the mentioned pattern of the first four Brazilian cycles under consideration? That is, were there also factors exogenous to the cycles that prematurely interrupted the cyclical expansions? The first cycle, from the third quarter of 1995 to the first quarter of 1999, roughly coincides with the first Fernando Henrique Cardoso government (1995-1998), a period marked by the price stabilization that followed the implementation of the Real Plan and by the implementation of neoliberal reforms (Belluzzo and Almeida, 2002: chap. 8; Fishlow, 2011: 44-47, 50-65; Nobre, 2013: 69-89). Such cycle was characterized by the expansion that had the lowest average quarterly rate of growth among the 8 expansions from 1983 to 2016. The expansion was too weak to put pressure on the labor market and the average unemployment rate actually rose every year during the expansion, from 1995 to 1997. Besides being weak, it was also short, lasting only 9 quarters, whereas the average length of expansions is 12.4 quarters (taking into consideration the 5 cycles being examined). Such expansion could not have led to a cyclical profit squeeze and the profit rate fell only with the onset of the contraction, mainly caused by the contagion from the East Asian crisis (Brenner, 2002/2003: chap. 6; Palma, 2006), which ultimately led to the abandonment of the fixed exchange rate regime in early 1999.

The subsequent cycle, from the first quarter of 1999 to the fourth quarter of 2001, was similar in several aspects, being characterized by a short and weak expansion that had little impact on the labor market. Its expansion phase was a quarter shorter than the one of the first cycle, but it was slightly stronger[xiv]. In this case, the unemployment rate fell,

but very mildly: the average rate for 1998, the year of the previous contraction, was 8.4 percent, whereas the average for 2000, the last year of the expansion, was 7.8 percent. The data suggests that the profit rate peaked in the last quarter of 2000, while the expansion lasted until the first quarter of 2001, but the mentioned evidence points against interpreting this interval as a late expansion characterized by a cyclical profit squeeze[xv]. This second cycle roughly coincides with Cardoso's second government (1999-2002), which was characterized by the establishment of the so-called macroeconomic tripod: inflation targeting, flexible exchange rates, and primary surplus targets (Pastore and Pinotti, 2005; Farhi, 2006; Nobre, 2013: 89-100). The policy shift did not succeed, however, in reducing the fragility that plagued the economy and the expansion was eventually cut short, mainly, by the Nasdaq crash that ultimately led to a recession in the U.S. (Brenner, 2002/2003: chap. 10) and in other rich countries, being the contraction intensified by an energy crisis in Brazil in mid-2001.

Cycle III, from the fourth quarter of 2001 to the second quarter of 2003, comprises the last year of Cardoso's second government and the crisis triggered by the speculation around the election in which Luís Inácio Lula da Silva, from the Worker's Party, was first brought to office (Pastore and Pinotti, 2005; Paulani, 2008). Its expansion was even shorter than the previous two, lasting only 4 quarters, and again unemployment rate rose, instead of falling. It is difficult to understand why the profit rate would fall during such expansion, but, although it did peak in its first quarter, its decline was very small, being almost stable until the ensuing contraction, which began in the fourth quarter of 2002. The immediate cause of the latter was the economic turmoil related to the election that took place in October. Anticipating the victory of Lula, capital flight led to a depreciation of 64 per cent of the Brazilian real against the dollar, between April and

October 2002. To contain the impact of the depreciation on the inflation rate, the central bank increased the nominal interest rate from 18 to 26.5 percent, between October 2002 and March 2003, in a procyclical move common in peripheral economies (Kaminsky, Reinhart, and Végh, 2005; Ocampo, Rada, and Taylor, 2009).

The fourth cycle, from the second quarter of 2003 to the first quarter of 2009, is similar to the previous three in the fact that it ended due to the impact of a foreign shock: in this instance, the contagion effects of the financial crisis that erupted in the U.S. in the fall of 2008. However, it differs from the previous ones in the length and strength of its expansion: it lasted for 21 quarters and its average annualized quarterly rate of growth was 5.2 percent. Such long and strong expansion was bound to impact the labor market: the average unemployment rate declined from 12.3 to 7.9 percent, between 2003 and 2008. As a consequence of this impact, of policies adopted in the period, and of changes in the occupational structure, the profit share oscillated around a declining trend throughout the period, but that was compensated by increases in the capacity utilization rate and the capacity/capital ratio. The profit rate could thus keep increasing until the contraction, peaking in the same quarter that output peaked. This trajectory will be further analyzed in the next section.

To further examine the cyclical pattern of the Brazilian economy, the rates of change of the profit rate for each phase of the cycles (early expansion, late expansion, and contraction) can be decomposed in its three determinants: the profit share, the capacity utilization rate, and the capacity/capital ratio. The results are presented in Tables 2, 3.1 and 3.2 and in Figure 2, below.

[TABLES 2, 3.1 AND 3.2 AND FIGURE 2]

The results obtained have several similarities to the ones presented by Weisskopf (1979), even though the first four cycles examined here were cut short by exogenous factors, thus not presenting cyclical profit squeezes. Such similarities suggest that the cyclical interaction between the relevant variables take place despite the "truncated" character of the expansions. The increase in the rate of profit during the early expansion, phase A, is mostly explained by an increase in the profit share both in the Brazilian (Table 2) and in the U.S. (Weisskopf, 1979: table 4) cases. An increase in utilization also plays an important role. In the late expansion, phase B, in its turn, the decline of the profit rate is almost exclusively explained by the decrease of the profit share, with the utilization and the capacity/capital ratio playing minor roles, also both in the Brazilian and in the U.S. cases.[xvi] Finally, during the contraction, phase C, the main determinants of the decline of the profit rate are falls of the profit share and of utilization that are of comparable magnitudes – in the U.S. case the role of the profit share is a bit larger, whereas in the Brazilian case the opposite is true. In all phases, the role of the capacity/capital ratio is almost negligible, in the two cases being compared.[xvii,xviii]

It should be noted, finally, that the results presented above, in Tables 2, 3.1, and 3.2, seem to be robust. First, an alternative series for the profit rate was calculated using a different estimate of the capital stock[xix]. Second, the decompositions of the changes in the profit rate were calculated based on two other slightly different dating of the cycles and of the cycle phases. The results of all these different calculations, which are available upon request, were qualitatively very similar. However, the use of a different

measure of utilization has greater impact on the results, enhancing the role of the capacity/capital ratio in the trajectory of the profit rate and reducing that of utilization. For a presentation of this alternative and a brief analysis of its implications, see Appendix 6.

3. THE COMMODITIES BOOM, THE LONG EXPANSION, AND THE PROFIT SQUEEZE

Taking into consideration this summary of the data for the last five Brazilian business cycles, the present section will focus on an examination of the profit squeeze that took place in the last late expansion, between 2010 and 2014, and of its origins. Figures for the unemployment rate suggest that, in fact, the contraction that resulted from the onset of the crisis in the U.S., in 2008, should be interpreted as a short interruption of a long expansion that took place between 2003 and 2014, comprising the two Lula's governments and the first government by Dilma Rousseff. The unemployment rate, which was at 12.3 percent in 2003, reached 7.9 in 2008, remained practically stable in 2009 (with an average of 8.1), despite the contraction, and went on falling afterwards until 2014, when it had reached 4.8 percent. In 2010, when the profit squeeze began, it was at 6.7.

It is not unlikely that the early expansion of the fourth cycle was close to turn into a profit squeeze when it was suddenly cut short by the contagion effects of the crisis that began in the U.S. It had lasted more than 5 years, being, by a wide margin[xx], the longest expansion that took place in Brazil of all the business cycles that have been dated (that is, from 1983 onwards). Moreover, the rise of the profit rate was caused by increases in

utilization and in capacity/capital ratio, which more than compensated the observed decrease in the profit share, and both variables had reached their peaks, for the period between 1996 and 2016, in 2008. That is, their increase in cycle V did not take them to the level they had attained in cycle IV (see Figure 2 and Table 3.2). Be that as it may, the contraction that began in mid-2008 decreased sharply the three components of the profit rate, creating the conditions for a new increase that began in the first quarter of 2009 and lasted until the third quarter of 2010. This relatively short early expansion, which lasted only 7 quarters, however, would probably not have led to a profit squeeze were it not for the fact that it began in conditions (especially regarding the labor market) very close to the ones in which the previous expansion ended.

The first issue to be addressed is the reason why this long expansion was possible, given that expansions are typically weak and truncated not only in Brazil, but in Latin America as a whole, as mentioned previously. This characteristic is mainly a consequence of the region's vulnerability to foreign shocks. Hence, a long expansion could only come about if such vulnerability were, for some reason, attenuated. The 2000's commodities boom and the abundance of liquidity related to it did precisely that. It allowed the Brazilian economy to run current account surpluses from 2003 to 2007 and the government to accumulate trillions of dollars in foreign reserves, becoming a net external creditor. According to Biancarelli, Rosa, and Vergnhanini (2017), this "new reality" of the Brazilian balance of payments allowed the economy to go through its longest expansion to date without facing currency shortages, to absorb the foreign shock of 2008, avoiding a currency crisis, and to resume growing quickly despite the deterioration of international liquidity conditions. The magnitude of this positive impact is suggested by the fact that the commodities boom in question lasted twice as long as

the average one (12 and 6 years, respectively) and resulted in a change in real commodities prices that was more than twice as large as the average increase (88.7 and 39.1 percent, respectively), according to Reinhart, Reinhart, and Trebesch's (2016: table A1, online appendix) data for all the 13 commodities booms that they identify between 1790 and 2015. The bust, in its turn, was not as significant, lasting only 4 years (in comparison to an average of 6 years) and reducing real commodities prices in 25.1 percent (slightly less than the average decline of 25.8 percent). It did have a contractionary impact on the Brazilian economy through "indirect channels" (Biancarelli, Rosa, and Vergnhanini, 2017), but it did not result in a sudden contraction.

The first Lula government (2003-2006) took advantage of the policy space provided by the commodities boom to adopt measures that increased aggregate demand, especially an institutional stimulus to household borrowing[xxi], an acceleration of the real increases of the minimum wage and an expansion of social transfers (*Bolsa Família* program). The rise in exports that resulted from the commodities boom also played a role in stimulating demand. Moreover, in the turn from the first to the second Lula's government, a deliberate attempt to increase direct public investment takes place alongside an increase in investment by state enterprises (mainly by Petrobras, the oil company). All this factors contributed to the first part of the long expansion, the early expansion of cycle IV.[xxii]

The increase in the profit rate observed in the period deviated from the typical[xxiii] early expansion in one aspect, already mentioned: the profit share declined almost from the beginning of the expansion and the profit rate only increased because such decline was compensated by increases in utilization and in capacity/capital ratio (Table 3.2). It has

been argued, from the standpoint of a structuralist Goodwin model, that the decrease in the profit share observed in the period was not only a result of growth acceleration (and its effect on the labor market), but also a product of policies that increased the bargaining power of workers (mainly, the increases in the real value of the minimum wage) and of the sectoral pattern of growth (Rugitsky, 2017). The impact of the latter on the profit share took place through a composition effect: the growing share (in aggregate value added) of sectors with below-average profit shares of income reduced the average profit share independently of any squeeze in profit shares that took place within sectors.[xxiv] Available estimates, resorting to different levels of disaggregation and focusing on slightly different time periods, suggest the relevance of this effect. Dias and Ruiz (2016: 14) estimate that the composition effect accounted for 42.5 percent of the decrease in the profit share observed between 2005 and 2009. Marcolin (2017: 32) finds a lower, but still relevant, figure: 23.7 percent of the decline observed between 2004 and 2009 can be attributed to a composition effect. Finally, Martins (2017: 108) calculates that 71.4 percent of the decline observed between 2004 and 2007 was due to these sectoral shifts, while in the following period, between 2007 and 2010, half of the decline was due to the composition effect.

The increase in utilization can be explained by the expansion itself and the fact that it compensated the effect of the falling profit share on the profit rate is something suggested in the Kaleckian literature. Regarding the capacity/capital ratio, its movement is likely a function of the commodities boom and its effects on terms of trade and exchange rates, as suggested in Appendix 6. But two additional factors should also be mentioned. One is the sectoral pattern of growth, given that the sectors that had its share of value added increased in the period (especially, some activities in the services sector)

probably had above-average capacity/capital ratios[xxv]. The second factor is related to Steindl's (1952/1976: 175-191) claim that the observed trajectory of the output/capital ratio could reflect, rather than actual technological factors, a changing age structure of the capital stock[xxvi]. Martins (2017: 52) estimated this effect, which did contribute, albeit moderately (less than 20 percent), to the increase in the capacity/capital ratio from 2004 to 2007.

After the abrupt fall in the profit rate that took place during the contraction from mid-2008 to early 2009, which was determined by a fall of its three determinants (Table 3.2), the profit rate resumed growing until the third quarter of 2010. Such growth was mainly a product of an increase in profit share and utilization. The increase in the profit share, as Figure 2 suggests, does not seem to imply a reversal of the developments that were causing it to decrease in the beginning of the long expansion, but probably reflects just labor hoarding, as the wage share grew markedly with the onset of the crisis and declined with a similar intensity when economic activity recovered.

During the profit squeeze, from mid-2010 to early 2014, the profit share falls again, but now faster than it had fell during the beginning of the long expansion. Such decline seems to be explained by the typical mechanism of the cyclical profit squeeze, that is, a tight labor market. This is suggested both by the fact that the unemployment rate had reached low levels during this period and by Marcolin's (2017) and Martin's (2017) estimates of the role of the composition effect on the decline during this period: they find a positive composition effect on the profit share, which is more than compensated by a strong intra-sectoral decrease. In other words, while in the beginning of the long expansion the decrease in the profit share seems partly a result of the sectoral pattern of

growth, which contributed to the impact of falling unemployment, during the profit squeeze its determinant was the reduction of the profit share by stronger workers within each sector. Such changing nature of the fall of the profit share is also suggested by the fact that the number of strikes and of hours not worked start to grow in 2009 and accelerates in 2011 (Summa and Serrano, 2017: 11-15). In addition, the number of private sector strikes more than double between 2012 and 2013 (Braga, 2016: 73). During the profit squeeze, class conflict came to the fore.

Although the main determinant of the decline of the profit rate was the fall of the profit share, declines in both utilization and in capacity/capital ratio contributed as well. The fall of utilization is a result of the deceleration of growth observed in the period. In what concerns the capacity/capital ratio, its decline was likely in part a result of the fall in the commodities prices and the related fall in terms of trade and depreciation of the exchange rate. Moreover, according to Martins (2017: 52), 40 percent of the decline observed between 2010 and 2013 can be attributed to a changing age structure of the capital stock.

The profit squeeze, which lasted from the third quarter of 2010 until the outbreak of the last contraction in the first quarter of 2014, covered the first three years of Rousseff's first government (2011-2014) and might illuminate the controversies about the causes of the economic deceleration that characterized it. Some authors, like Serrano and Summa (2016), suggest that the deceleration was mainly a consequence of the contractionary nature of the economic policy shift that took place between 2011 and 2013, comprising a decrease in public investment (allegedly to allow for a reduction of the interest rate) and a depreciation of the exchange rate.[xxvii] Macroprudential policies

adopted in 2010 also played a role, pushing household borrowing down. Alternatively, Singer (2015) claims that the deceleration seems to have had a more political nature, reflecting the opposition of the ruling classes to the policies implemented by Rousseff's government.[xxviii]

The occurrence of a cyclical profit squeeze, precisely during this period, may contribute to its understanding. On the one hand, the economic policy shift aimed at stimulating private investment, at least partly through policies that had a positive impact on profit margins, counteracting thus the profit squeeze. The fact that it did not succeed in increasing investment and maintaining the pace of economic growth can be attributed to the fact that the policies adopted had an ambiguous effect on the profit rate, pushing it down through a decrease of utilization at the same time that it attempted to push it up through an increase in margins.[xxix] On the other hand, the profit squeeze provides a material basis for the aggravation of class conflict that underlies Singer's (2015) narrative. The political turmoil that mounted from 2013 onwards was a crucial determinant of the depth of the contraction that followed.

The interaction of economics and politics is acknowledge by part of the literature on the cyclical profit squeeze from its beginning. In a classical paper from 1943, Kalecki claimed that a situation of persistent full employment would be resisted by capitalists, who would fear its social and political implications, that is, the strengthening of the working classes. Assuming, as he did, a functional distribution of income that would not oscillate cyclically, Kalecki argued that full employment tended to raise the profit rate (through an increase in utilization), but "'discipline in the factories' and 'political stability' are more appreciated by business leaders than profits." (1943: 326) The

contraction would result, in this case, by capitalists' pressure on the government to cut down its expenditures. He suggested calling the resulting cyclical pattern a "political business cycle." (330)[xxx]

Boddy and Crotty (1975) questioned Kalecki's point that the boom increased the profit rate resorting to an empirical exercise similar to Weisskopf's (1979). But, despite claiming that the cyclical contractions might be partly attributed a profit squeeze, they did not disregard the political motives identified by Kalecki. In their words, "[t]he Marxian economic effects of the business cycle reinforce the socio-political aspects stressed by Kalecki." (1975: 5) The recent Brazilian crisis seems to be a particularly clear illustration of such interaction of economics and politics: the profit squeeze had been aggravating the distributive conflict and pushing down the growth of investment since 2010, when in 2015 the ruling classes' calls for austerity finally prevailed and the abrupt contraction of public expenditures resulted in a large fall of economic activity. Additional factors certainly played a role, like the fall in commodities prices in 2015 and a corruption scandal that paralyzed the construction sector, but the crisis cannot be understood without taking into consideration the profit squeeze and its economic and political effects.

4. CONCLUDING REMARKS

With sparse research on the cyclical dynamics of profit rates in peripheral economies, the results here presented should be considered preliminary. It would be interesting to investigate whether analysis for longer periods or for peripheral countries other than Brazil would lead to similar results, that is, that profit squeezes are rare due to the

truncated nature of the business cycles' expansion. More specifically, future research could examine whether other South American countries that were similarly impacted by the commodities boom also presented longer expansions followed by a profit squeeze and whether other recent crises that occurred in the region could be, at least partially, related to the latter. Moreover, the results for Brazil could be complemented in numerous ways, for instance by investigating in detail the role of relative prices on the trajectories of the capacity/capital ratio and of the profit share and by decomposing the changes of the profit share in changes in real wages and in labor productivity.

A strategic question remains for those interested in the prospects of a less unequal Brazilian society. Countercyclical macroeconomic policies are certainly crucial in order to overcome the weak character of the expansions, which keep unemployment at high levels and hinders workers ability to shift the distribution in their favor. As Pérez Caldentey and Titelman (2014) argue, such countercyclical policies, if combined with adequate policies focused on productive development, may also play an important role in terms of the long-run trajectory of the economy, given that trend and cycle are arguably interdependent. But, by attenuating the impact of foreign shocks, countercyclical policies that allow for longer and stronger expansions may lead to profit squeezes and to aggravated class conflicts. In the recent Brazilian case, such conflicts manifested themselves in dramatic fashion, revealing the fragility of democracy itself. The struggle for equality will require, it seems, more than foreign bonanzas, countercyclical policies, and long expansions. It will require a deeper transformation of society, shifting the power balance in favor of the great majority, so that, in the future, when class conflicts result once more in cyclical profit squeezes, democracy can be preserved and social regression can be avoided.

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APPENDIX 1: DATA – METHODS AND SOURCES

1) Profit Share: It is defined as one minus the labor share of income. An annual series for the latter, ranging from 1996 to 2015, is calculated as the ratio of employees' compensation to the sum of employees' compensation and gross operational surplus, using data from national accounts (specifically, *Tabelas de Recursos e Usos, Nível 12, Tabela 2*). This follows Gollin's (2002) second suggested adjustment, which considers that gross mixed incomes comprise both labor and capital income in the same proportions as the remainder of national income. The calculated annual series is, then, transformed into a quarterly one resorting to a, seasonally-adjusted, monthly labor share series calculated from *Pesquisa Mensal do Emprego* (Monthly Employment Survey). Concretely, the proportional deviation of the share of each quarter in relation to the corresponding annual figure is used to bring the annual national accounting series to a higher frequency. The figures for 2016 are estimated in a similar way resorting to data from the household survey (*Pesquisa Nacional por Amostra de Domicílios*). Total profits are calculated by multiplying total value added, obtained from the quarterly national accounts, and the profit share.

2) Capital Stock: Following conventional procedure (Marquetti, Maldonado, and Lautert, 2010; Souza Júnior, 2017), an annual series for the net capital stock is calculated using the Perpetual Inventories Method, which is based on the investment flow and parameters related to asset depreciation (such as life time and depreciation rate). Details about this calculation can be found in Martins (2017). To bring the calculated series to a quarterly frequency, we resort to the quarterly deviations from the annual average from the quarterly series calculated by Souza Júnior (2017), the same procedure adopted to estimate the quarterly labor share – a potential limitation is that the latter includes residential stock, in contrast to the annual figure estimated by Martins (2017). Alternatively, the rates of change of the profit rate and of its components were recalculated using a different series for the quarterly capital stock: a series that resulted from multiplying the data from Souza Júnior by the average share of nonresidential capital stock in total capital stock, for each year, as estimated by Martins (2017). Results were very similar.

3) Capacity utilization rate: Seasonally adjusted series for the capacity utilization of the industrial sector calculated by the Brazilian National Confederation of Industry (*Confederação Nacional da Indústria*). The alternative series for the whole economy, discussed in Appendix 6, is obtained by weighting indicators for each of the three major sectors (industry, agriculture, and services) in relation to their share in value added. The indicators for agriculture and services were calculated following the procedure suggested by Bonelli (2016). In each case, the log of the series of seasonally adjusted aggregate output, from the quarterly national accounts, is obtained and the local maximum semesters are considered to represent full capacity utilization. The full capacity for each semester is then given by the polynomial equation that connects these

peak points and the capacity utilization rate, by the ratio between the observed value and the calculated full capacity.

4) Dating of cycles: Dating provided by the Brazilian Committee for the Dating of Business Cycles (*Comitê de Datação de Ciclos Econômicos*).

5) Rates of change: Following Weisskopf (1979), the annual growth rate of each variable x is obtained by ordinary least squares regression of log x on time (measured in years). The annual growth rates of each phase are obtained by the average growth rates of the respective phases in each cycle.

APPENDIX 2: TABLES

TABLE 1: RECENT OUTPUT AND PROFIT CYCLES IN BRAZIL (1996-2016)				
Cycles	Keypoint	Quarter	Real Output, Y*	Profit Rate, ρ**
I	Y-trough	1995.3***	271.614	30,45%
	Y-peak, ρ-peak	1997.4	289.022	35,57%
	Y-trough	1999.1	285.173	30,66%
II	Y-trough	1999.1	285.173	30,66%
	ρ-peak	2000.4	304.605	36,09%
	Y-peak	2001.1	305.476	33,01%
	Y-trough	2001.4	303.004	36,16%
III	Y-trough, ρ-peak	2001.4	303.004	36,16%
	Y-peak	2002.4	318.918	35,35%
	Y-trough	2003.2	314.458	34,80%
IV	Y-trough	2003.2	314.458	34,80%
	Y-peak, ρ-peak	2008.3	410.266	41,28%
	Y-trough	2009.1	385.507	34,09%
V	Y-trough	2009.1	385.507	34,09%
	ρ-peak	2010.3	433.437	38,86%
	Y-peak	2014.1	474.345	35,85%
	Y-trough	2016.4	435.615	27,59%

* GDP at constant 2000 Brazilian Reais (millions)

** See statistical appendix

*** Data for the first quarter of 2016, for lack of information for the preceding period.

TABLE 2: RATES OF GROWTH OF BASIC VARIABLES - PHASE AVERAGES*			
	Phases		
	A	B	C
Rate of profit, ρ	2,1%	-2,6%	-3,5%
Share of profits, σ_π	1,0%	-2,2%	-1,1%
Capacity utilization rate, φ	0,7%	0,1%	-1,5%
Capacity/capital ratio, ζ	0,1%	-0,2%	-0,5%

* All figures represent average annual % rates of growth

TABLE 3. 1: RATES OF GROWTH OF BASIC VARIABLES*							
	Cycle I		Cycle II			Cycle III	
	A	C	A	B	C	B	C
	1996.1-1997.4	1997.4-1999.1	1999.1-2000.4	2000.4-2001.1	2001.1-2001.4	2001.4-2002.4	2002.4-2003.2
Rate of profit, ρ	3,6%	-2,6%	3,1%	-15,5%	5,1%	-0,9%	-1,4%
Share of profits, σ_π	3,1%	-1,5%	2,0%	-12,9%	5,5%	-2,7%	-0,1%
Capacity utilisation rate,	0,4%	-1,0%	1,4%	0,1%	-1,6%	0,8%	-1,8%
Capacity/capital ratio, ζ	-0,3%	0,2%	-0,6%	-1,1%	0,7%	1,1%	0,6%

* All figures represent average annual % rates of growth

TABLE 3.2: RATES OF GROWTH OF BASIC VARIABLES*					
	Cycle IV		Cycle V		
	A	C	A	B	C
	2003.2-2008.3	2008.3-2009.1	2009.1-2010.3	2010.3-2014.1	2014.1-2016.4
Rate of profit, ρ	0,7%	-16,6%	3,5%	-1,5%	-4,1%
Share of profits, σ_π	-0,4%	-9,0%	1,7%	-0,6%	-1,5%
Capacity utilisation rate,	0,4%	-3,9%	1,5%	-0,2%	-1,2%
Capacity/capital ratio, ζ	0,6%	-2,0%	-0,1%	-0,5%	-1,0%

* All figures represent average annual % rates of growth

APPENDIX 3: FIGURES

FIGURE 1: RECENT OUTPUT AND PROFIT CYCLES IN BRAZIL (1996-2016)

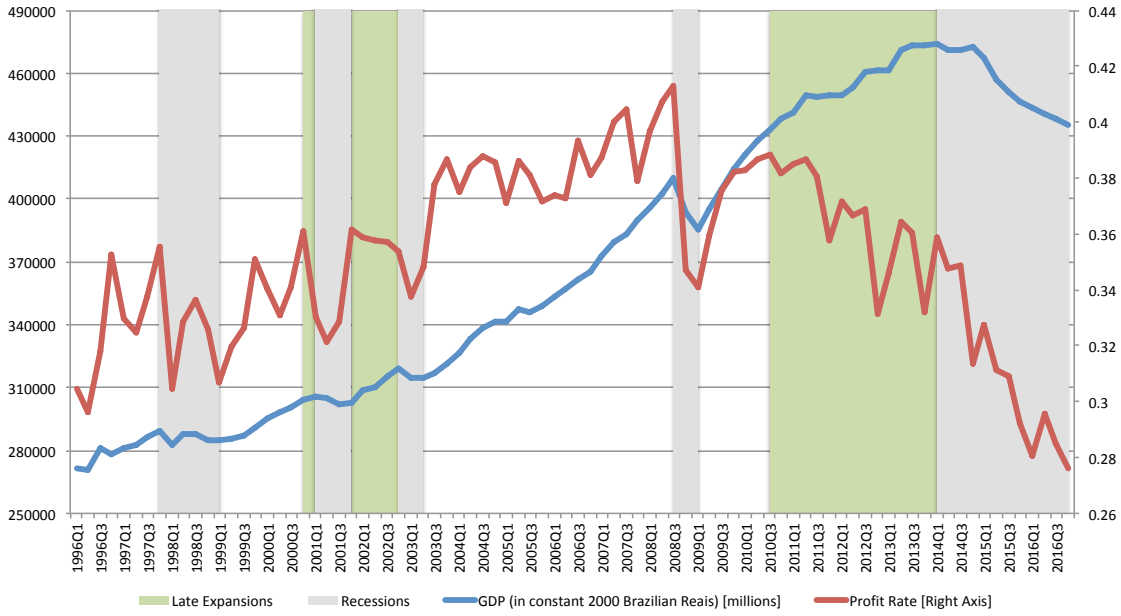
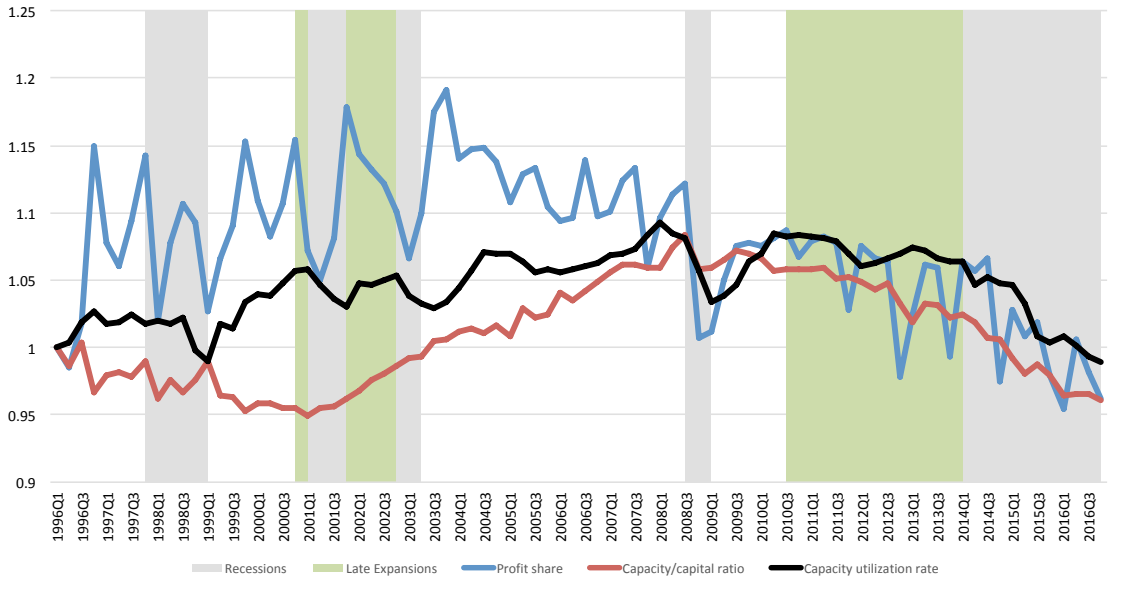


FIGURE 2: PROFIT RATE AND ITS COMPONENTS (1996-2016)
[index: 1996Q1=1]



APPENDIX 4: ADDITIONAL TABLES

TABLE A1: RATES OF GROWTH OF BASIC VARIABLES - PHASE AVERAGES (*with alternative measure for the capacity utilization rate)**			
	Phases		
	A	B	C
Rate of profit, ρ	2,1%	-2,6%	-3,5%
Share of profits, σ_π	1,0%	-2,2%	-1,1%
Capacity utilization rate, φ	0,2%	0,1%	-0,4%
Capacity/capital ratio, ζ	0,7%	-0,2%	-1,6%

* All figures represent average annual % rates of growth

TABLE A2: RATES OF GROWTH OF BASIC VARIABLES (*with alternative measure for the capacity utilization rate*)*							
	Cycle I		Cycle II			Cycle III	
	A	C	A	B	C	B	C
	1996.1-1994.4	1997.4-1999.1	1999.1-2000.4	2000.4-2001.1	2001.1-2001.4	2001.4-2002.4	2002.4-2003.2
Rate of profit, ρ	3,6%	-2,6%	3,1%	-15,5%	5,1%	-0,9%	-1,4%
Share of profits, σ_π	3,1%	-1,5%	2,0%	-12,9%	5,5%	-2,7%	-0,1%
Capacity utilisation rate,	0,2%	-0,2%	0,3%	-0,4%	-0,2%	0,4%	-0,9%
Capacity/capital ratio, ζ	-0,1%	-0,6%	0,5%	-0,6%	-0,7%	1,6%	-0,2%

* All figures represent average annual % rates of growth

TABLE A3: RATES OF GROWTH OF BASIC VARIABLES (*with alternative measure for the capacity utilization rate*)*					
	Cycle IV		Cycle V		
	A	C	A	B	C
	2003.2-2008.3	2008.3-2009.1	2009.1-2010.3	2010.3-2014.1	2014.1-2016.4
Rate of profit, ρ	0,7%	-16,6%	3,5%	-1,5%	-4,1%
Share of profits, σ_π	-0,4%	-9,0%	1,7%	-0,6%	-1,5%
Capacity utilisation rate,	0,1%	-0,5%	0,2%	0,1%	-0,4%
Capacity/capital ratio, ζ	0,9%	-5,4%	1,2%	-0,8%	-1,9%

* All figures represent average annual % rates of growth

APPENDIX 5: ADDITIONAL FIGURES

FIGURE A1: TWO MEASURES OF CAPACITY UTILIZATION RATE (1996-2016)

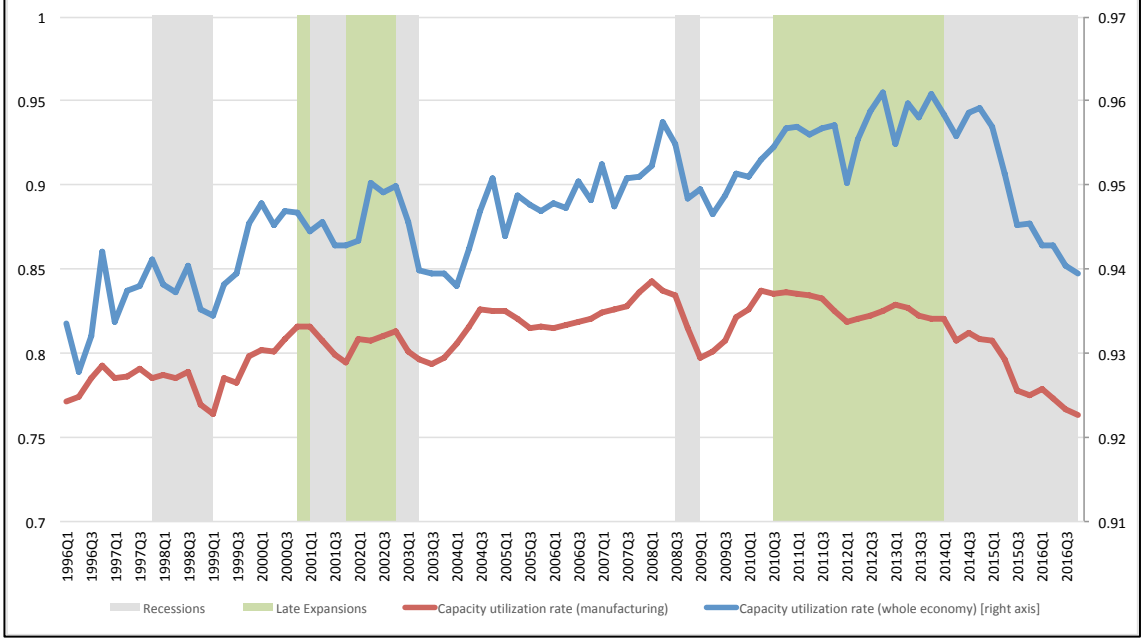


FIGURE A2: CAPACITY/CAPITAL RATIO AND TERMS OF TRADE (1996-2016) -
***with alternative measure for the capacity utilization rate* [index: 1996Q1=1]**

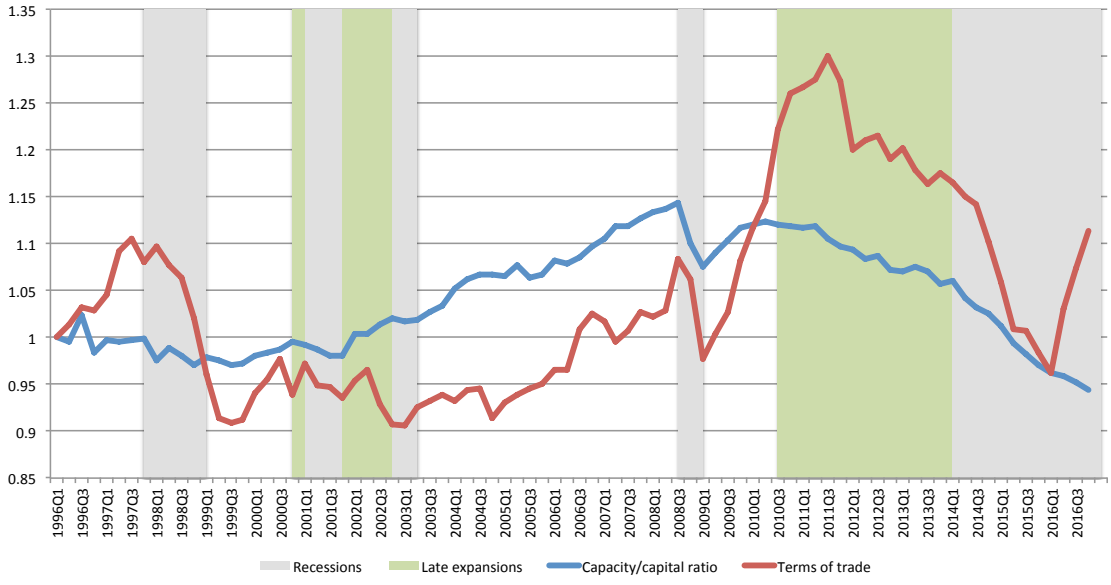
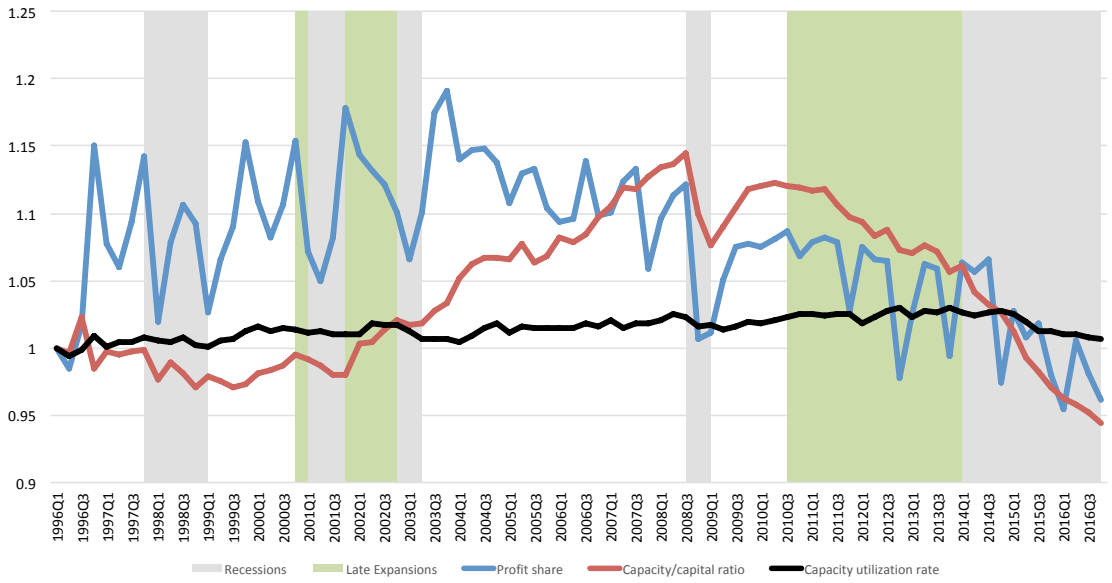


FIGURE A3: PROFIT RATE AND ITS COMPONENTS (1996-2016) - *with alternative measure for the capacity utilization rate* [index: 1996Q1=1]



APPENDIX 6: DIFFERENT MEASURE OF THE CAPACITY UTILIZATION RATE AND ITS IMPLICATIONS

Weisskopf (1979) argues convincingly that the relative roles of the rising strength of labor and of aggregate demand may not be captured precisely by the relative roles of the profit share and of utilization in the decomposition suggested by his framework. The reason is that the "overhead character of part of the work force" (354) may underestimate the actual role of utilization, given that, during early expansions, the profit share should rise in the presence of overhead labor due to its utilization on a larger scale, an effect independent of the weakened position of workers that also generally characterizes phases A. Such observed increase in the profit share should be considered, according to him, a result of rising utilization, instead of a result of workers' weakness[xxxi].

However, there is also reason to believe that the role of utilization might be in fact overestimated. The results presented in the present paper were calculated using a capacity utilization series for the industrial sector, following the option made by Weisskopf (1979). There are well known difficulties in obtaining data for capacity utilization, both in terms of precision and of scope (Nikiforos, 2016), and with industry representing an ever smaller share of total value added one should be suspicious of simply considering the industrial capacity utilization as a proxy of utilization for the entire economy. Considering that, a different series for utilization was constructed, combining the data for industry with estimated capacity utilizations for the agriculture and the service sectors in an average utilization (weighted by the relative shares of the sectors in aggregate output), following a procedure suggested by Bonelli (2016). The two alternative series are presented together in Figure A1. Replacing the series of utilization for the industrial sector for the one for the whole economy, the results obtained are presented in Table A1.[xxxii]

[FIGURE A1 AND TABLE A1]

From Figure A1, it is clear that the two measures of utilization are highly correlated.[xxxiii] But, as could be expected, the measure for the whole economy oscillates on a narrower band. As a consequence, opting for the latter, the impact of changes in utilization on the profit rate become almost negligible in the average for phases A and C, while the trajectory of the capacity/capital ratio, which was itself secondary before, becomes more important as a determinant for the change in the profit rate (Table A1). This can also be grasped by comparing Figure 2, in the main text, and Figure A2, in Appendix 5. Supposing that the alternative measure for utilization is more precise, the question that remain refers to what could be causing the change in the capacity/capital ratio, given that the other two determinants (profit share and utilization) can be interpreted in light of the theoretical framework proposed by Barbosa-Filho and Taylor (2006), but the capacity/capital ratio was simply assumed constant in that formulation.

Weisskopf (1979: 342-344) argues that a fall of the capacity/capital ratio can be interpreted as an indication of the rising organic composition of capital[xxxiv], one of the variants of Marxian crisis theory that he discusses.[xxxv] The estimated series for the capacity/capital ratio for Brazil do not show this downward trend (Figure A2, below), but the period covered may be too short for capturing a long-term tendency - temporality to which such a theory applies. The research from Marquetti, Maldonado, and Lautert (2010) identify a declining trend of the real output/real capital ratio of the Brazilian economy from the early 1950s to the early 1990s. (If the rate of capacity utilization oscillates around a constant long-run level, the long-run trajectory of the capacity/capital ratio should be similar to the one of the output/capital ratio.) Their data covers the period until 2003 and, from the early 1990s onwards, their estimated output/capital ratio is almost stable, a result compatible with the trajectory of the capacity/capital ratio estimated for the present research[xxxvi]. Then, the ratio increased for the next two cycles, from 2001 to 2009, and declined afterwards, until the end of the last cycle.

It is plausible to interpret this recent rise and fall of the capacity/capital ratio as a result of shorter-run factors instead of as a manifestation of the factors that underlie the rising organic composition of capital. Weisskopf (1979) himself maintains that the observed capacity/capital ratio could be subject to shifting relative prices of output and capital stock. Indeed, it is well known that the prices of non-tradable goods rose faster than those of tradable goods in Brazil since the early 2000s, in part due to the appreciation of the exchange rate (Summa and Serrano, 2017). Given that the share of tradable goods is probably larger in the capital stock than in output as a whole, such difference in inflation rates could explain at least part of the increase in the capacity/capital ratio in the first decade of the 21st century[xxxvii]. The decline of the capacity/capital ratio, which gathered speed after 2011, could have been caused, in its turn, by the depreciation of the exchange rate that took place contemporaneously and its effect on the inflation rates of tradable and non-tradable goods.[xxxviii] Such hypothesis is further backed by the similar trajectories, depicted in Figure A2, of the capacity/capital ratio and of the Brazilian terms of trade, which was a main determinant of the movements of the exchange rate in the period and itself is closely related to the commodities boom (Martins, 2017: 70-80; Rugitsky, 2017: 1-2). The problem with that interpretation is that the capacity/capital ratio estimated for the present research is in real, rather than nominal, terms, so it should not reflect the shifts in relative prices. This issue deserves further research in order to assess whether the deflators used to estimate the series for real output and real capital stock were in fact able to eliminate entirely the impact of the trajectory of relative prices.

[FIGURE A2]

ENDNOTES

[i] For the case of Brazil, see especially Marquetti, Maldonado, and Lautert (2010) and Marquetti and Porsse (2014). Weisskopf (1988) himself had to change his framework when he extended his research to other rich countries, having available only annual figures.

[ii] According to the dating of cycles by, respectively, the National Bureau of Economic Research (NBER) and the Brazilian Committee on the Dating of Business Cycles (CODACE). This difference remains if alternative periods are considered. The average length of all 11 cycles that the U.S. economy went through since 1945 is just below 6 years (23.2 quarters) and the cycles for the Brazilian economy considered in this research, that is, those between 1995 and 2016, had an average of a little more than 4 years (17 quarters).

[iii] See also Pérez Caldentey, Titelman, and Carvallo (2014).

[iv] On the commodities boom, see Erten and Ocampo (2013) and Reinhart, Reinhart, and Trebesch (2016).

[v] This presentation was in part inspired by Lavoie's (2017) recent analysis of Weisskopf (1979), which suggested the usefulness of examining the latter alongside Kaleckian growth and distribution models. For a recent literature review of cyclical profit squeeze theories that focuses rather on the Marxist contributions, see Basu, Chen, and Oh (2013: 577-580).

[vi] Another model of demand-driven cycles inspired by Goodwin was formulated by Skott. For a comparison of the latter with Barbosa-Filho and Taylor's, see von Arnin and Barrales (2015).

[vii] The impact of utilization on distribution is explained by the same underlying mechanism that links growth to distribution in Goodwin's model. An increase in utilization pushes real wages up, resulting in a rate of growth above that of labor productivity, squeezing profits. Hence, they call it a "Marxist" distributive curve. Some of the literature on the cyclical profit squeeze assumes that, in the late expansion phase of the cycle, the rate of labor productivity growth is pushed down at the same time that real wages are being pushed up. The logic behind such effect is that "an increase in working class power enables workers to resist more successfully capitalist efforts to increase work intensity (via increased discipline, speed-ups, and other measures designed to increase labour efficiency units per hour of work) and thereby to reduce the rate of growth of labor productivity." (Weisskopf, 1979: 346) See also Boddy and Crotty (1975: 8) and Goldstein (1996: 57). Of course there are also reasonable grounds to suppose that an increase in utilization accelerates rather than decelerates the rate of labor productivity growth, as Barbosa-Filho and Taylor (2006: 398) suggest, due to "technological, scale and composition effects" (the so-called Kaldor-Verdoorn law would be an example). Be that as it may, the inverse relation between utilization and the profit share depends only on the impact of utilization on wages being stronger than its impact on productivity. It does not require rising utilization to decrease the rate of growth of labor productivity, neither it is incompatible with such decrease.

[viii] They are following, in this formulation, the literature on Kaleckian growth and distribution models, pioneered by Rowthorn (1981), Dutt (1984), Taylor (1985), Blecker (1989), and Bhaduri and Marglin (1990).

[ix] Another way to interpret the meaning of Barbosa-Filho and Taylor's (2006) extension of Goodwin's (1967) model is to argue that they conceived of a framework that combines two variants of the Marxist literature on cycles, the "rising strength of labor" variant and the "realization failure" one, whereas Goodwin (1967) incorporated only the former. See, on the debate between the different variants of explanation of the cyclical profit squeeze, Boddy and Crotty (1975, 1976), Sherman (1976, 1997), Weisskopf (1979, 1988), Goldstein (1996, 1999), and Basu, Chen, and Oh (2013).

[x] Profit share, rate of capacity utilization, and capacity/capital ratio.

[xi] In a more elaborate analysis, in which he takes into consideration the role of overhead labor in the cyclical dynamics of the profit share, he obtains a more substantial role for the rate of capacity utilization (and correspondingly a weaker role for the profit share) in the changes of the profit rate observed in phases A and C. (See Lavoie [2017] on the importance of these results for current controversies on the econometric estimation of demand and growth regimes.) But his characterization of the profit squeeze in the late expansion does not change significantly.

[xii] See Henley (1987), Bakir and Campbell (2006, 2009, 2017), and Izquierdo (2013). Goldstein (1996: 59) argues that the expansion of the cycle between 1980 and 1982 "is better interpreted as a blip in a collapse that extends from 1979-82." See also Goldstein (1996: 71).

[xiii] Moreover, Izquierdo (2013) argues that in two other cycles (one in the late 1950s, the other in the early 1970s) the late expansions were too short and the profit rate declines too small for them to be characterized as cyclical profit squeezes. In his words, in these cases, "it would be difficult to argue that the decline of the general profit rate acted as a precipitating factor of the cyclical crisis" (2013: 466).

[xiv] Average annualized quarterly growth rate was 3.7 percent, instead of 3.5 percent.

[xv] It is noteworthy that value added – that is, GDP minus indirect taxes net of subsidies – peaked in the same quarter as the profit rate.
[xvi] Given that two of our three phases B are hardly typical representatives of a cyclical profit squeeze, it might be more adequate to compare the average results for the U.S. with the one obtained for the phase B of last Brazilian business cycle being examined (Table 3.2). In the latter case, the decline of the profit share is still the main determinant of the fall in the profit rate, but a decline in the capacity/capital ratio has a similar impact. This cycle will be examined in in more detail in the next section.
[xvii] It is true that such phase averages overcast the differences among the individual cycles, as can be seen in the results presented in Tables 3.1 and 3.2, but that is also the case in the research with data for the U.S. economy.
[xviii] The rates of change of the profit rate and of its determinants are much larger in the calculations made by Weisskopf (1979) than in the ones presented here. This might be due to the fact that his data refers only to the nonfinancial corporate business sector, whereas for the Brazilian case the profit rate is estimated for the whole economy, which is plausibly less volatile than most of its constituent parts, including the nonfinancial corporate business sector.
[xix] Using a share of the quarterly capital stock form Souza Júnior (2017) that approximates the non-residential capital stock (see Appendix 1).
[xx] Just two other expansions lasted longer than 3 years, one in the early 1980s and the one from cycle V.
[xxi] Allowing a new kind of credit with automatic repayments from the paycheck, the so-called *crédito consignado*.
[xxii] See Carvalho and Rugitsky (2015) and Rugitsky (2017). See also Barbosa Filho and Souza (2010), Serrano and Summa (2012), and Corrêa and Santos (2013).
[xxiii] Identified both in the research for the U.S. and in the present one.
[xxiv] For an interpretation of this sectoral pattern as the result of cumulative sectoral dynamics involving income distribution, consumption pattern, and the sectoral compositions of output and employment, see Rugitsky (2017). See also Medeiros (2015) and Loureiro (2017).
[xxv] Data to assess this hypothesis is very limited, but Martins (2017: 63-70) made an attempt.
[xxvi] The issue is related to the way of measuring the capital stock. For the calculation of the profit rate, it is appropriate to use the net capital stock, since it is "designed to reflect the wealth of the owner of the asset at a particular point in time" (OECD, 2009: 56). However, according to Steindl (1952: 176): "Gross capital (...) will in general be much more related to the productive capacity than net capital". The OECD (2009) also points to gross capital as a more adequate proxy for productive capacity. As shown by Martins (2017: 47-55), changes in the rate of investment may have a greater effect on the value of capital than on its productive capacity, under or overestimating changes in capital productivity. In addition, it is also shown that the ratio of net to gross capital indicates changes in the average age of the capital stock, hence the name "age structure of the capital stock".
[xxvii] That the latter could be contractionary has been famously argued by Krugman and Taylor (1978), building on previous work from Hirschman and Diaz-Alejandro.
[xxviii] The economic policy shift was implemented counting on the support of industrial capital, to compensate for the fact that it tended to alienate financial interests. The bet on the division of the ruling classes failed, according to Singer (2015), who identifies a reunification of the bourgeoisie from 2012 onwards. See also Rugitsky (2015).
[xxix] Given that part of the policies consisted in a decrease in payroll taxes, its impact would only be felt on the after-tax profit rate, instead of on the gross (before taxes) profit rate used in the present research. It would be interesting to examine whether the two in fact diverged in this period, an issue that could be pursued in future research.
[xxx] See Rugitsky (2013: 457-461).
[xxxi] He suggests a way to correct the profit rate decomposition for this potential bias, using wage and salaried employees as proxies for, respectively, "direct" and "overhead" labor. Unfortunately, data for such correction is very limited in the Brazilian case.
[xxxii] The versions of Tables 3.1 and 3.2 and of Figure 2 for the estimation with this alternative series for utilization can be found in Appendixes 4 and 5. Future research could also resort to measures of the output gap as proxies to the capacity utilization rate in order to assess the robustness of the present results.
[xxxiii] The calculated correlation between the two series is 0.776.
[xxxiv] A rise in the organic composition would result in a fall of the rate of profit, through its negative impact on the capacity/capital ratio. From a theoretical standpoint, the rising organic composition of capital is rooted in capital's tendency to replace living for dead labor, that is, workers for machines, in order to control the work force. In other words, a tendency towards increasing mechanization or a result

of Marx-biased technical change, as it is alternatively referred to (Shaikh, 1978; Basu, 2010). The actual trajectory of the organic composition, however, is subject to several factors, which affect the different concepts that underlie it: the technical, value, and materialized compositions of capital (Shaikh, 1987/1990). Be that as it may, this variant suggests a long-term rise in the organic composition, which should manifest itself in a long-term fall in the capacity/capital ratio.

[xxxv] Weisskopf (1979: 343, footnote) admits that the translation of a theory formulated in a "value framework" to a "price framework," so that it can be empirically examined with data from national accounting systems, is controversial. For a summary of the questions involved in this dispute, see Foley (1986: chap. 6).

[xxxvi] See also Marquetti and Porsse (2014).

[xxxvii] Moreover, the geographical shift of the production of machines and equipment to East Asia, in general, and China, in particular, has had the effect of holding its prices down, which could also have contributed to the observed trajectory of the ratio.

[xxxviii] It is interesting to note that, in the U.S. case, a falling capacity/capital ratio played a prominent role in the profit squeeze that took place around 1972 and 1973, in contrast to the secondary role it played in the other business cycles, according to Weisskopf (1979: 352, table 5). This may be related to the fact that this period was characterized by a depreciation of the dollar, following the cancellation of its convertibility to gold. See Brenner (1998/2006: 122-129). The prominent role of the capacity/capital ratio was not found, however, in later updates of Weisskopf's research, like the ones made by Bakir and Campbell (2006) and by Izquierdo (2013).