THE LIMITS OF INCOME REDISTRIBUTION AND GROWTH IN BRAZIL, 1992-2013

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Abstract: This paper explores the patterns of inequality and accumulation in Brazil, focusing on their class dimension, with the goal of revealing the advances and limits of the distribution of income that took place. Applying a typology of class positions to household surveys, the Gini coefficient of income is decomposed into inter- and within-class components using the ANOGI method. The paper finds an increase of class inequality during neoliberalism and an inflection afterwards, but confined to changes within categories of workers – the position of capital and social stratification were never challenged. This is then integrated with the country's pattern of accumulation, showing how growth and redistribution both reinforced each other for a period of time in a cumulative causation fashion, and then spelled their limits. The latter comprised an endogenous regressive structural change, which created a mid-term dependence on high international commodity prices for balance-of-payments solvency, and heightened cost-push inflationary pressures in services sectors. These limitations underscore the need for broad, multi-dimensional inequality-reducing measures and an encompassing strategy for catching up with leading global competitors.

Key words: inequality; class inequality; inequality decomposition; circular causation; growth patterns.

Resumo: Este trabalho explora os padrões de desigualdade e de acumulação no Brasil, com foco em sua dimensão de classe, visando revelar os avanços e os limites da distribuição de renda que ocorreu. Com base em uma tipologia de posições de classe aplicada a pesquisas domiciliares, o coeficiente de Gini da renda domiciliar per capita é decomposto em suas dimensões entre- e intragrupos por meio do método ANOGI. Verifica-se aumento da desigualdade de classes durante o neoliberalismo e uma inflexão durante a década de 2000, restrita, contudo, a mudanças entre diferentes categorias de trabalhadores. A posição do capital e a estratificação social não foram transformadas. Já a análise do padrão de acumulação da economia brasileira revela como o crescimento e a distribuição de renda se reforçaram mutuamente durante certo período, em causação circular, e depois também mutuamente determinaram seus próprios limites. Estes referem-se a uma mudança estrutura regressiva, endogenamente determinada, que provocou dependência de médio prazo em altos preços de commodities para garantir a solvência externa, e a tendência a inflação de custos nos setores de serviços. Tais limites demonstram a necessidade de medidas amplas e multidimensionais para a redução da desigualdade e uma estratégia sofisticada de catiching-up para o desenvolvimento do país.

Palavras-chave: desigualdade; desigualdade de classes; decomposição da desigualdade; causação circular; padrões de crescimento.

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CLASS INEQUALITY AND CAPITAL ACCUMULATION IN BRAZIL, 1992-2013

1. INTRODUCTION

Inequality, not only in terms of income, is a striking aspect of Brazilian society that has persisted through changing forms along the country's history. Although still high by any standard, there was a recent period in which inequality and poverty decreased in Brazil, particularly during the 2000s. This has happened, furthermore, accompanied by relatively high growth rates of output. Understanding how this combination was possible, especially as it was a novelty for the country, is thus of central importance for thinking its future development.

A task of even greater urgency is to understand the limitations of this process, as the country has been in a pronounced recession since 2014. This article hence seeks to discern the causes and the limits of the decrease of inequality in Brazil during its most intense period, between 2003 and 2013, framed against the developments of the preceding decade. This is done by exploring the class dimension of inequality in connection to the pattern of accumulation of the economy. This not only casts light on aspects of inequality usually not privileged in the economic literature, such as class stratification, but also reveals how developments in the sphere of distribution and of accumulation can be both mutually reinforcing and constraining.

The text is organised as follows. The second section reviews the literature on inequality in Brazil to draw out the recent drivers of de-concentration. It is reported how labour market developments and the expansion of pensions were the main phenomena, with minimum wage hikes playing a central role. The third section presents the methods used to analyse inequality, which comprise a typology of class positions applied to household surveys over which the Gini coefficient is decomposed with the Analysis of Gini (ANOGI) procedure. The fourth section employs this method for the 1992-2013 period. It shows how there were indeed positive gains during the last analysed decade, but restricted to a distribution of income between workers, with capital income remaining stable. The fifth section integrates these developments to the pattern of accumulation of the economy. It shows how there was a cumulative causation process explaining both growth and redistribution, whilst also leading to a regressive structural change and inflationary pressures that would become major constraints for its furtherance. The sixth section concludes.

2. INEQUALITY IN BRAZIL AND THE RECENT DRIVERS OF DE-CONCENTRATION

Since the early 2000s and up until recent years, there has been a redistribution of income in Brazil, summarised in the decrease of the Gini coefficient of per capita household income from 0.596, in 2001, to 0.527, in 2013 (according to data from the National Household Sampling Survey – PNAD). This de-concentration is all the more striking giving that it occurred when inequality was rising in most of the world, except for Latin America.

It is now well established that the main drivers were labour market-related developments, followed by the extension of state pensions and higher government transfers. Using income-source decompositions, Hoffmann and Oliveira (2014) estimated that these three dimensions respond, respectively, for about 55%, 22% and 17% of the decrease of the Gini coefficient between 2003 and 2011. The main autonomous driver of this process was the increase in real minimum wages (MW), which rose upwards of 70% between 2003 and 2013. This has several transmission channels, the most important of which (beyond the labour market) are state pensions and governments transfers linked to its value. Estimations suggest MW hikes respond for approximately 60 to 70% of recent income redistribution (Brito *et al.* 2016).

With the recent release of tax returns data, however, it was shown how inequality was much higher and more stable than measured in household surveys. The 1% appropriated approximately 25% of national income between 2006 and 2011, and the 0.1% took 10% (Medeiros *et al.* 2015a). The richest 71 thousand families, in 2013, may have appropriated nearly 8.5% of national income (Gobetti and Orair 2016b). Moreover, by combining the tax data with household surveys, it has been estimated that the Gini coefficient of household per capita income remained somewhat stable, going from 0.686 to 0.688 between 2006 and 2012 (Medeiros *et al.* 2015b). Not only this, capital-related income contributed strongly to inequality at the very top, and has become a greater and more concentrated share of income: restricting the sample to the 10% richest households, capital-related income responded for 26% of the inequality in 2006, and 39% in 2012 (Medeiros and Castro 2016b). Given that individuals do not pay income tax on profits in Brazil, recent studies have indicated the redistributive potential in doing so (Gobetti and Orair 2016a, 2016b).

Overall, the picture that emerges for inequality is one of substantial redistribution of labour market income, aided by government transfers and CCTs to the poorest households, but preserving top earnings once tax return data is taken into account. This article contributes to the debate in two ways. First, it employs a class-based view to income inequality, which has hitherto been little explored in the literature – particularly the economic one. The second contribution is relating inequality to the country's pattern of accumulation. This more encompassing approach reveals limitations to both the redistribution of income and the growth process.

3. METHODS

3.1. Operationalising class analysis with household survey data

The typology developed seeks to capture the essential characteristics and specificities of the Brazilian class structure, subject to data availability, whilst remaining sufficiently parsimonious to allow for detailed analysis of individual fractions. This led to a definition of eight positions, which allow for differences amongst employers and amongst workers and includes pensioners and the unemployed. Informality, a major characteristic of the Brazilian labour, is also duly incorporated.

Table 1 Definition of class positions

Class position	Position in the occupation	Occupational category	Size of the company	Access to social security (pensions)
Large employer	Employer	Irrelevant	>10 employees	Irrelevant
Small employer	Employer	Irrelevant	<=10 employees	Irrelevant
Professional workers	Self-employed, (in)formal employee,	High-skilled	Irrelevant	Irrelevant
Low-skilled, formal workers	Self-employed, Formal employee	Low-skilled	Irrelevant	Yes
Low-skilled, informal workers	Self-employed, Informal employee	Low-skilled	Irrelevant	No
Self-consumption	Self-consumption, Non-remunerated	Irrelevant	Irrelevant	Irrelevant
Unemployed	Unemployed	–	–	Irrelevant
Pensioners	–	–	–	Yes

Source: Prepared by the authors.

Three dimensions of the class structure organise the typology: command over capital (and conversely the need to sell one's labour power), command over scarce skills, and basic protection by the prevailing labour laws (i.e., formality of the employment relation). Those not in active employment are classified as unemployed or pensioners, as appropriate. More specifically, using data from the National Household Sampling Survey (PNAD), from 1992 to 2013, the identification of class positions is based on four main variables: position in the occupation, skill level required for the occupational category, number of employed workers (for employers) and access to social security. Position in the occupation is classified into four categories: employers, self-employed, formal waged employees, informal waged employees and workers for self-consumption or non-remunerated. The occupations were classified according to their skill level they required, into either professional/managerial ones or low-skilled ones. For individuals classified as employers, a distinction was made in terms of the number of employees, differentiating between those who employed more or less than ten people. Finally, access to social security was considered positive when either the person was in a formal employment relation or when she contributed to a private pension scheme. These variables define the following positions, summarised in Table 1:

1. Large employers: employers of more than 11 employees, the most privileged position based on the command over large amounts of labour;
2. Small employers: employers of 10 or less employees, an intermediate position based on commanding a smaller amount of labour;
3. Professional workers: employees or self-employed workers in high-skilled occupations. They are also an intermediate position, which still have to sell their labour power but can do so at relatively more advantageous conditions given their command over scarce skills;
4. Low-skilled, formal workers: formal employees or self-employed workers that contribute to social security, in low-skilled occupations. This group has to sell their labour power without the bargaining power scarce skills offer, but are covered by basic labour laws;

5. Low-skilled, informal workers: informal employees or self-employed that do not contribute to social security, in low-skilled occupations. These are the most precarious workers;
6. Self-consumption workers: workers with no monetary income from their activity;
7. The unemployed: those classified as looking for jobs but unable to find them;
8. Pensioners: former workers who receive private or state pensions.

This typology is small enough to be manageable, whilst capturing the essential dimensions of class inequality. As seen in section 4, there are consistent differences between the positions in terms of their relative income, stratification and so on, which vindicate the framework. Moreover, the typology could also locate where the main changes to inequality occurred, which were later successfully related to aspects of the pattern of accumulation.

3.2. Decompositions of inequality indices and the ANOGI method

The analysis of inequality employs the ANOGI method.[2] Consider a population comprising k mutually-exclusive groups with n_i members, who receive non-negative income y. The overall population $y_U = y_1 \cup y_2 ... \cup y_k$ is denoted by the subscript U. Let μ_i be the mean income of group i, so that $p_i = \frac{n_i}{n_U}$, $s_i = \frac{n_i \mu_i}{\sum_{j=1}^{k} n_j \mu_j}$ and $\eta_i = \frac{\mu_i}{\mu_U}$ are respectively the population-share, the income-share and the relative income of group i. Let $F_i(y_i)$ represent the cumulative distribution of y in group i. F_i, with a single subscript, indicates the expected value of $F_i(y_i)$ and F_{ji}, with two subscripts, indicates the expected rank of individuals from group i had their income been ranked according to the distribution of group j (note to the order of the notation).[3]

F_{Ui} is thus the expected rank of group i in the overall population, higher (lower) than 0.5 if the majority are above (below) median income. This re-ranking procedure thus allows one to assess how are individuals of two groups distributed in relation to each other or to the overall population, and is robust to extreme incomes. Note, also, that F_{Ui} is a population-weighted average of group i's mean rank in the distribution of all k groups, including itself:

$$(1) \qquad F_{Ui} = \sum_{h=1}^{k} p_h F_{hi} = p_i F_{ii} + \sum_{h=1, h \neq i}^{k} p_h F_{hi} = 0.5 p_i + \sum_{h=1, h \neq i}^{k} p_h F_{hi}$$

Using the covariance-based formula, the Gini Mean Distance (GMD) and the Gini coefficient (G) of y_i are, respectively, equal to:

$$(2) \qquad GMD_i = 4 \operatorname{cov}\left(y_i, F_i(y_i)\right)$$

$$(3) \qquad G_i = \frac{2 \operatorname{cov}\left(y_i, F_i(y_i)\right)}{\mu_i}$$

[2] For a more detailed exposition and proofs, please consult Frick *et al*. (2006) and Yitzhaki and Schechtman (2013).

[3] When assessed according to its own distribution, naturally $F_i(y_i) = 0.5 \; \forall \; i$.

We can now define the covariance between the income of group *i* and its rank according to group *j*, the basis for the overlapping index:

$$\text{(4)} \qquad \text{cov}_{ji} = \text{cov}\left(y_i, F_j\left(y_i\right)\right) = \frac{1}{n_U}\sum_{h=1}^{n_i}\left[\left(y_h - \mu_i\right)\left(F_j\left(y_h\right) - F_{ji}\right)\right]$$

And the resulting overlapping index, O_{ji}, is:

$$\text{(5)} \qquad O_{ji} = \frac{\text{cov}_{hi}}{\text{cov}_{ii}} = \frac{\sum_{h=1}^{n_i}\left[\left(y_h - \mu_i\right)\left(F_j\left(y_h\right) - F_{ji}\right)\right]}{\sum_{h=1}^{n_i}\left[\left(y_h - \mu_i\right)\left(F_i\left(y_h\right) - 0.5\right)\right]}$$

where cov_{ii} is the covariance between the income and the rank of group *i*, ranked according to its own distribution. O_{ji} is an indicator of how much is the distribution of group *j* contained in the range of *i* (once again, pay attention to the order of the notation). It is, in this sense, an indicator of the overlapping of the two distributions, or the inverse of stratification. The higher is O_{ji}, the more the two distributions overlap (*j* being inside *i*); the lower it is, the more *i* is a stratum.

O_{ji} varies between 0, when the groups do not overlap at all, and increases as a larger share of *j* is in the range of *i*. When the two distributions are very similar it approaches 1, and its theoretical maximum is 2. This value is approached as *i* becomes much more spread than *j*, so that not only is *j* contained in *i*, but is also concentrated in a sub-range of the latter (its mean). A summary follows:

1. O_{ji} is a growing function of the proportion of the observations of *j* that are in the range of *i*;
2. Conversely, O_{ji} decreases as *i* forms a stratum in relation to *j*;
3. O_{ji} is bound between 0, when *i* is a perfect stratum in relation to *j*, and 2, when it is a degenerate grouping;
4. O_{ji} equals 1 if the two distributions are the same;

With this is mind, it is possible to define the overall overlapping index of group *i*, O_i. It is a population-weighted average of its overlapping indexes with all other groups, including itself:

$$\text{(6)} \qquad O_i = \sum_{h=1}^{k} p_h O_{hi} = p_i O_{ii} + \sum_{h=1, h\neq i}^{k} p_h O_{hi} = p_i + \sum_{h=1, h\neq i}^{k} p_h O_{hi}$$

O_i is thus a measure of how much are the distributions of all groups contained in that of *i*. Contrary to O_{ji}, O_i is bound from below by p_i.

The final concepts needed are the two between-groups Gini coefficients. The first, taken from Pyatt (1976), is the Gini coefficient of the vector of group-mean incomes, G_{BP}. It is the Gini coefficient if all individuals received the mean income of their group:

$$(7) \qquad G_{BP} = \frac{2}{\mu_U}\mathrm{cov}\left(\mu_i, F_m\left(\mu_i\right)\right) = \frac{2}{\mu_U}\sum_{h=1}^{k}\left[p_h\left(\mu_h - \mu_U\right)\left(F_{mh} - 0.5\right)\right]$$

where the subscript *m* indicates the population of group-mean incomes, so that F_{mi} is the mean rank of group *i* in this hypothetical population. The alternative between-groups, G_B, equals:

$$(8) \qquad G_B = \frac{2}{\mu_U}\mathrm{cov}\left(\mu_i, F_{Ui}\right) = \frac{2}{\mu_U}\sum_{h=1}^{k}\left[p_h\left(\mu_h - \mu_U\right)\left(F_{Uh} - 0.5\right)\right]$$

The difference between these two formulations is in the rank that is used to represent the groups: whereas in (7) it is the rank of the group's mean income, in (8) it is the mean rank of the group. Thus, G_{BP} is 0 if all groups have got the same mean income, whereas G_B is 0 if this situation holds *or* if they have all got the same mean rank. This is why G_B can be see as an overlapping-adjusted version of G_{BP}, as it takes into account the uneven distribution of group ranks in the population. In fact, it can be proven that:

$$(9) \qquad G_B \le G_{BP}$$

the equality holding when none of the groups overlap with each other (which means that the overall O_i indexes are equal to p_i). In this sense, the relationship G_B / G_{BP} can also be taken as an indicator of the quality of the classification employed, approximating 1 with perfect stratification.

Finally, the decomposition can be presented:

$$(10) \qquad G = G_{IG} + G_{IGO} + G_{BP} + \left(G_B - G_{BP}\right) = \sum_{h=1}^{k} s_h G_h + \sum_{h=1}^{k} s_h G_h \left(O_h - 1\right) + G_{BP} + \left(G_B - G_{BP}\right)$$

where G_{IG} is the intra- or within-groups Gini coefficient and G_{IGO} is the effect of overlapping on within-groups inequality. The four terms can be described as follows:

1. G_{IG}: pure within-groups inequality, it is an income-share-weighted average of Gini coefficients calculated over members of each group, disregarding overlapping. It varies between 0, when the members of all groups receive the group's mean income, and *G*, when all groups have got the same mean income or mean rank;
2. G_{IGO}: the same as above, but multiplied by the overlapping indexes minus 1, to assess the impact that overlapping (less-than-perfect stratification) has on within-groups inequality. It approaches $-G_{IG}$ as groups grow small and do not overlap with each other (so that O_j approaches 0 for all groups); it is 0 if there is perfect overlapping in all groups;
3. G_{BP}: the pure between-groups Gini. It varies between 0, when all groups have got the same mean income, and *G*, when the members of all groups receive the group's mean income;
4. $\left(G_B - G_{BP}\right)$: the impact that overlapping (less-than-perfect stratification) has on between-groups inequality. Its maximum value is 0, when there is no overlapping, and it will be below $-G_{BP}$ if groups are malformed enough strata to make G_B sufficiently negative.

Equation (10) can also be simplified into two terms, by adjusting both the within-groups and the between-groups components for overlapping. This leads to the following formulation:

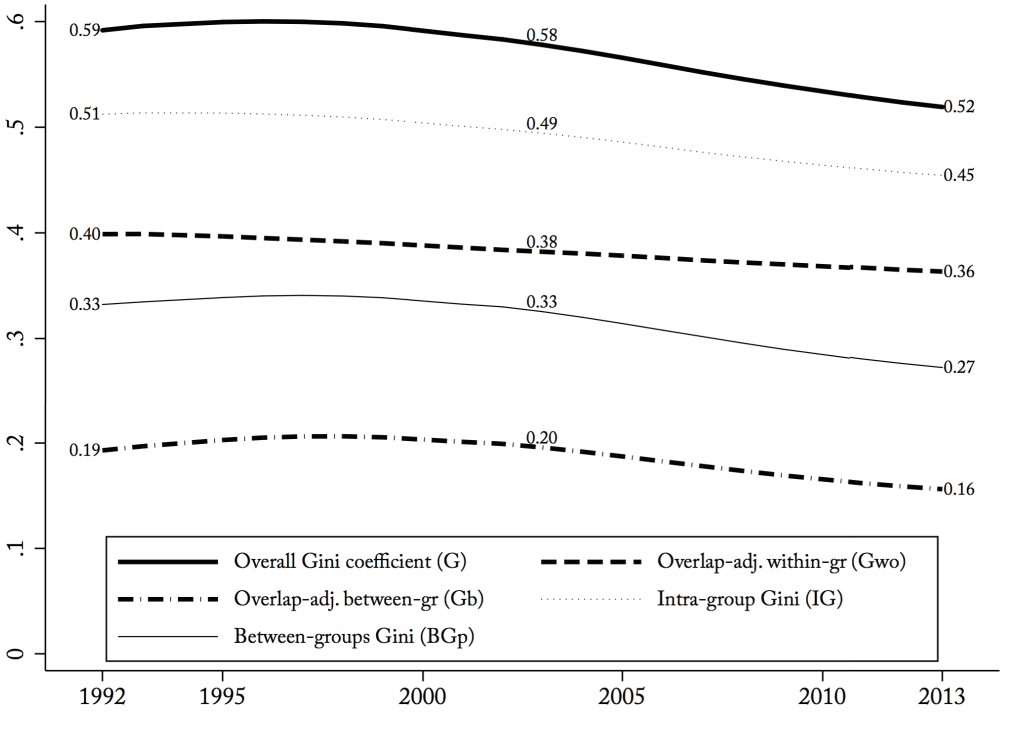
$$(11) \qquad G = G_{WO} + G_B = \sum_{h=1}^{k} s_h G_h O_h + \frac{2}{\mu_U} \mathrm{cov}\left(\mu_i, F_{Ui}\right)$$

where G_{WO} is the overlapping-adjusted within-groups inequality.

4. A CLASS PERSPECTIVE ON BRAZILIAN INEQUALITY

This section explores the patterns of inequality in Brazil, focusing on their class dimension. It is shown how within-class inequality fell over all the period, whereas between-class inequality increased during the 1990s and fell in the following decade. This latter process was restricted, however, to changes between different workers, with the position of capital unchanged.

Figure 1 Gini coefficient of household per capita income in Brazil and decomposition by class positions ($G, G_{WO}, G_B, G_{IG}, G_{BP}$), 1992-2013



Note: Smoothed values shown for years 1992, 2003 and 2013; lowess smoothing applied.
Source: Prepared by the author based on data from the PNAD, 1992-2013.

Figure 1 reports the breakdown of inequality into within- and between-groups components for the whole period, together with the relevant effects of overlapping on both terms. Table 4, in the appendix, presents the same data, but without smoothing, and indicates the percentage of total inequality explained by each component. A first observation, which vindicates the framework employed, is that between-class inequality was a relevant phenomenon throughout, as it accounted for between 30 and 35% of total inequality (column X of Table 4).

The overall movements of inequality, with a slight rise during the beginning of the period followed by stagnation and then a consistent decrease, hide different class dimensions. Whilst within-class inequality decreased by between one and two points during the 1990s, depending on the years of comparison, between-class inequality increased by approximately the same amount. Similarly, stratification increased considerably, as G_b got about four p.p. closer to G_{BP}. This period encom-

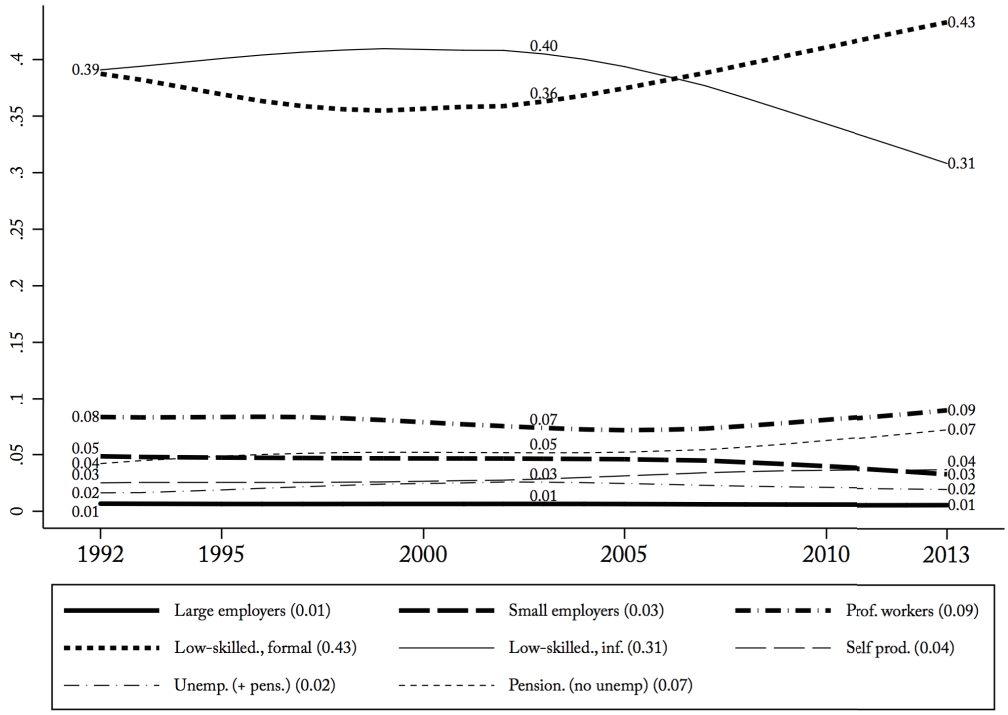
passes the end of high inflation, which happened in 1994, as well as the transition to neoliberalism. Therefore, if neoliberalism did not imply an overall increase of inequality as big as in other countries, it increase class inequality and lead to a sharper demarcation of class positions.

From the 2000s onwards, on the other hand, both within- and between-class inequality fell, with a concomitant decrease of stratification. This result is line with most of what the literature has indicated (Hoffmann and Oliveira 2014, Souza and Carvalhaes 2014), and represents an important break with previous trends. This article contributes to understanding inequality Brazil as it explores this process in more detail, highlighting what it meant for class relations in Brazil, which fractions benefitted or not from it and, in section 5, showing its relation to the country's pattern of accumulation.

4.1. Class inequality between 1992 and 2013: a detailed view

This section reveals that there were losses for most of the popular classes during the 1990s, followed by nuanced gains afterwards. These comprise a class structure with smaller shares of more vulnerable positions, as well as closing income gaps for some groups. These gains are, however, tempered by an almost-unchanging position of workers vis-à-vis capitalists. Only professional workers really lost relative income, rank and status. In other words, relations between different groups of workers changed, but their position to capital was much more stable.

Figure 2 Population-share (p_j) of class fractions in Brazil, 1992-2013



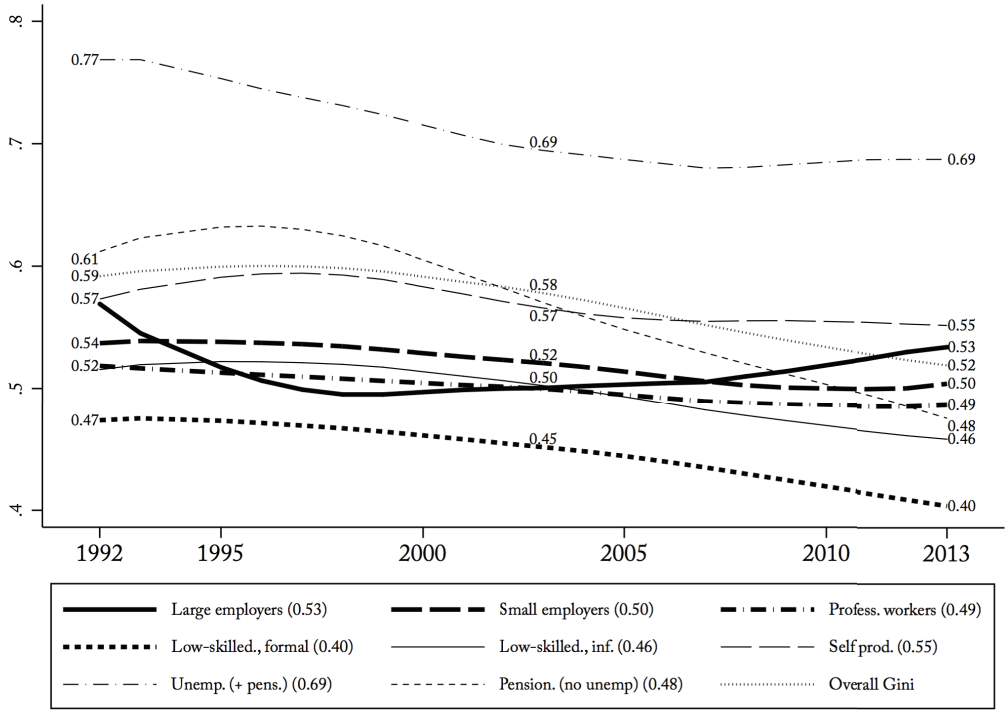
Note: Smoothed values shown for 1992, 2003 and 2013; 2013 values shown to help identify; lowess smoothing applied.
Source: Prepared by the author based on data from the PNAD, 1992-2013.

The dimension that (alongside within-group concentration) saw the greatest changes throughout the two sub-periods regards the class structure, i.e., the population-share of each fraction. As seen in Figure 2, the size of the formal and informal low-skilled working class changed considerably, with approximately 10 p.p. swings between trough and peak. Apart from this, the only other relevant developments are the smaller increases of professional workers and pensioners.

Informality, an important dimension of labour precarisation, reached its peak in 1999 (42% of the population) and then decreased sharply, especially after the mid-2000s, reaching 31% in 2013. As a demonstration of the effects of neoliberalism on class structure, it is only in 2007 that the formal working class would return to its population-share of 1992 (39%), having reached a zenith of 34% in 1999. The rise of labour informality can thus be seen as the main driver of the increase of class inequality during the 1999s, and an major dimension of the latter's decrease afterwards.

These are clearly important developments for class relations and inequality, given that, in 2013, low-skilled, formal households enjoyed average incomes approximately 45% higher and an intra-group Gini coefficient five points lower than their informal counterpart (see Figure 3 and Figure 4). The composition of the working class as a whole thus changed significantly throughout the period. A focus on these trends should not obfuscate, however, that in 2013 more than thirty per cent of the population still was part of the low-skilled, informal working class – and hence in a very precarious position not even covered by basic labour laws.

Figure 3 Gini coefficients of intra-group income concentration (G_j) for the decomposition of household per capita income by class positions in Brazil, 1992-2013



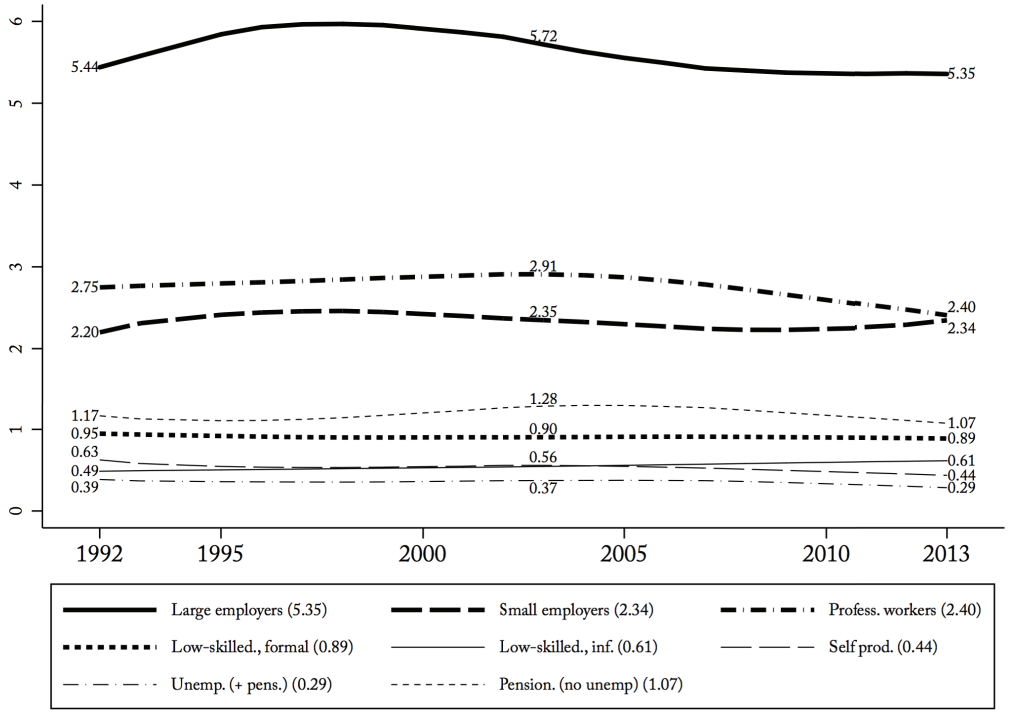
Note: Smoothed values shown for 1992, 2003 and 2013; 2013 values shown to help identify; lowess smoothing applied.
Source: Prepared by the author based on data from the PNAD, 1992-2013.

Within-groups income concentration (see Figure 3), if it did change, followed a similar pattern for most classes but capitalists and pensioners. There is a considerable spread across the groups – about 15 points excluding the unemployed – and their order is mostly unchanged. The distributions of income for formal and informal workers move almost synchronically, standing five points apart from each other, and they jointly distance themselves from that for professional workers.

Only formal, low-skilled workers were substantially less concentrated than the whole population. This is still considerably high by international standards (a Gini of 0.40, against an OECD average, in 2014, of 0.32 (OECD 2016)). This highlights how income inequality is multifaceted in Brazil, the decrease of which requires changes internal to each class fraction, in addition to their position vis-à-vis each other and transformations of the class structure as a whole.

As for within-group income concentration, it was stagnant or slightly decreasing during most of the 1990s, and since then fell for all but capitalists. The most relevant trends regard low-skilled workers and pensioners. The Gini of low-skilled workers decreased two points between 1992 and 2003, and then a further five points until 2013. Rising minimum wages and the growth of relatively low-paid jobs are the most likely explanation of the latter (Brito *et al.* 2016, Komatsu and Menezes Filho 2015). Pensioners, in turn, had their income de-concentrated by four points (after a slight rise) and then by a staggering nine points. This was associated to greater pension coverage and to rising minimum wages, which index many benefits (Gobetti and Orair 2015). Finally, the income of capitalists has become more concentrated, in an ongoing concentration of capital.

Figure 4 Relative household per capita income (η_j) of class positions in Brazil, 1992-2013



Note: Smoothed values shown for 1992, 2003 and 2013; 2013 values shown to help identify; lowess smoothing applied.
Source: Prepared by the author based on data from the PNAD, 1992-2013.

As for the relative income of classes, there was much more stability than in the previously-analysed dimensions (see Figure 4). During the 1990s, there were small gains, of about 5%, for all privileged fractions (i.e., with mean income above unity), with the obverse holding for relatively-poor ones. Informal workers were the exception, but this a rather misleading phenomenon as it was accompanied by an increase in their number, most likely due to the precarisation of formal workers. Afterwards, there was a partial inflection of these trends, albeit more nuanced.

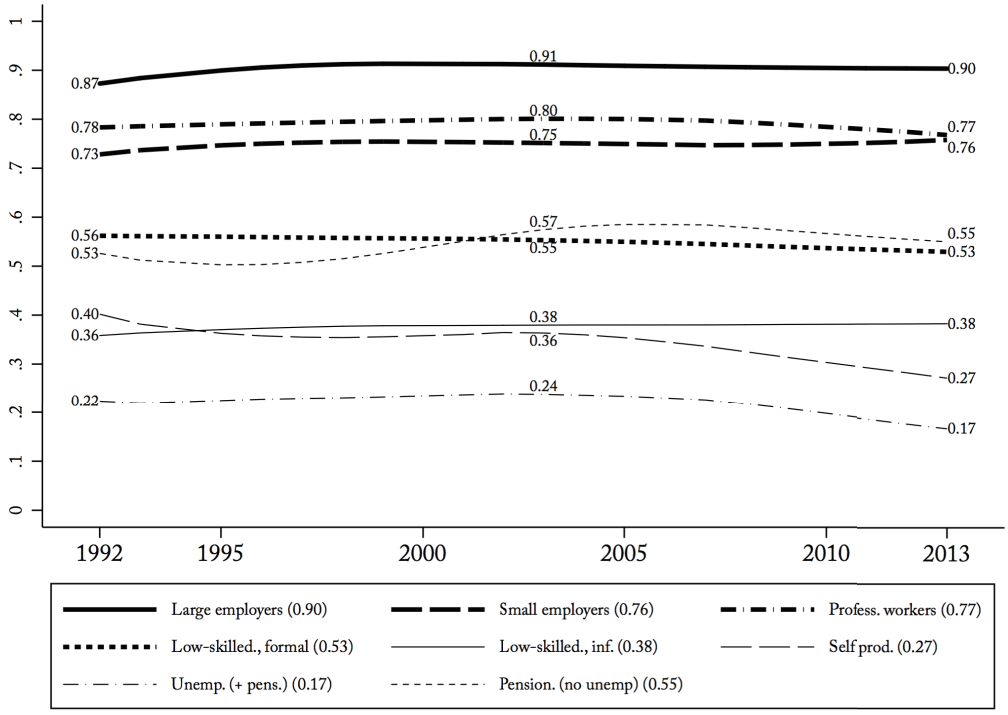
Between 2003 and 2013, the main change was the loss of relative income for professional workers, of about 20%.[4] Capitalists did lose, but not substantially (6%), whereas small employers were stable. The other important dimension amongst relatively-privileged groups was the decrease of the relative income of pensioners, which, alongside their higher population-share and lower income concentration, indicate the greater coverage of low-value benefits. On the lower side of the distribution, the 10% increase in the relative income of informal workers was noticeable.

A counter-intuitive result was that the relative income of low-skilled, formal workers did not increase, even in face of a 70% hike in the real minimum wage between 2003 and 2013 (Ipeadata). Even if their real income did increase by about 50%,[5] they were still approximately in the same social standing as before. Two main reasons stand behind this. First, the income of the second largest group (informal workers) grew considerably more. Second, there was a strong compression of formal, low-skilled wages between 1 and 2 minimum wages: in 2003, 44% of formal workers gained more than 2 MWs, a value that fell to 30% in 2013. This clustering around the MW undoubtedly explains much of the de-concentration of the group's income, but also indicates that well-paid positions in the labour market were not forthcoming during the decade.

In sum, after losses for the popular groups during the 1990s, the 2003-2013 period saw a preservation of capital income associated to a redistribution between categories of workers. This highlights how control over capital became a more efficacious means of climbing the social ladder, as compared to the possession of scarce skills. The income of professional workers decreased in lieu of informal, low-skilled workers, whilst formal workers stood still. As far as relative income is concerned, then, the 2000s redistribution was restricted to closing the gaps between different workers and pensioners (i.e., former workers), without any curtailing of capital income.

[4] Figueiredo Santos (2015: 94) shows that, between 2002 and 2011, not only the relative, but also the real median income of certain professional groups, fell.
[5] Deflated by the *Índice Nacional de Preços ao Consumidor* (INPC).

Figure 5 Mean rank of class positions (F_{uj}) in household per capita income in Brazil, 1992-2013



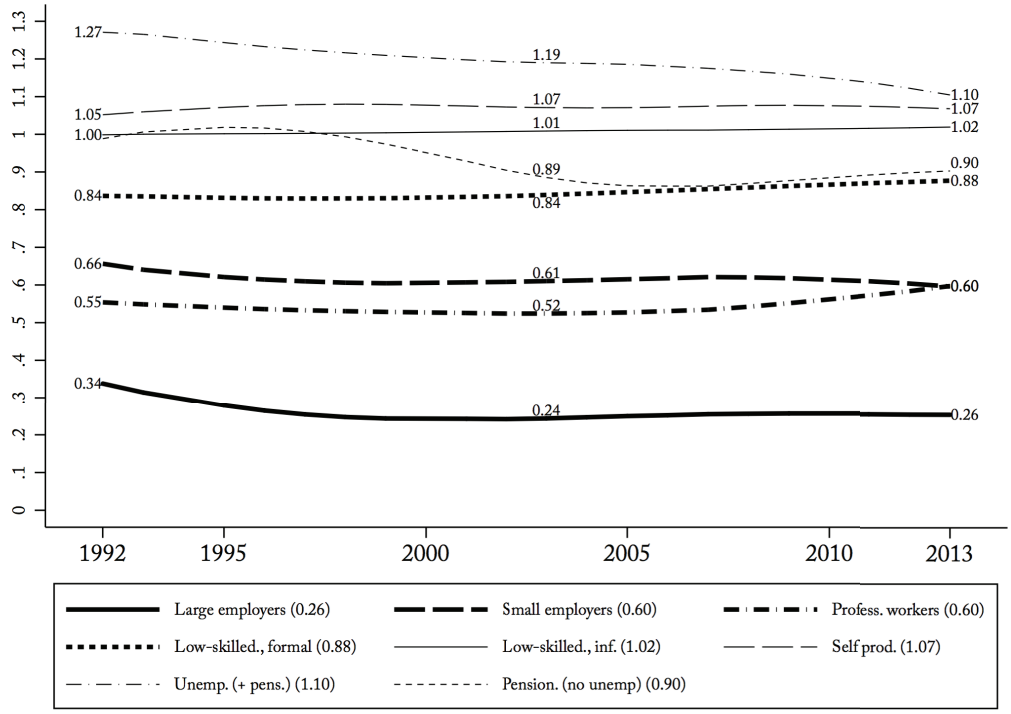
Note: Smoothed values shown for 1992, 2002 and 2013; 2013 values shown to help identify; lowess smoothing applied.
Source: Prepared by the author based on data from the PNAD, 1992-2013.

If with few exceptions there were no major changes in the relative income of class fractions, their mean rank displayed even greater resilience (see Figure 5). This is a somewhat expected result, as changes to this dimension would imply an overhaul of class relations that was absent in Brazil. Therefore, what can be seen is an enduring social hierarchy, with the different class fractions neatly stacked atop each other according to the expected order.

Under this general image of continuity, it can nevertheless be noticed how the 1990s saw a clearer demarcation of class positions, as all the relatively-privileged fractions increased their mean rank. The end of the high inflation period was an important moment in this development. It can thus be considered a regularisation of accumulation, which sharpened class hierarchies.

Changes during the 2000s were weaker. Small and large employers were essentially stable, whereas low-skilled, formal workers dropped two points. This signals, albeit modestly, that access to formal employment has become slightly less of a 'privilege of the dispossessed' than it used to be, and that the position of capitalists did not change. Only three fractions altered their mean rank by more than two points: besides the smaller groups of unemployed households and workers for self-consumption, who fell considerably, professional workers lost three points. Once again, the main changes during the 2000s were restricted to relations between workers, and profiting from the labour of others became relatively more important than controlling scarce skills.

Figure 6 Overlapping index of class positions (O_j) in the decomposition of household per capita income in Brazil, 1992-2013



Note: Smoothed values shown for years 1992, 2002 and 2013; 2013 values shown in legend to help identify classes; lowess smoothing applied.
Source: Prepared by the author based on data from the PNAD, 1992-2013.

The results presented so far are confirmed by an analysis of how stratification evolved (see Figure 6): there was a clearer demarcation of class positions in the 1990s (seen through lower overlapping indices) and a partial inflection afterwards, albeit restricted to different fractions of workers. The overall picture is, however, mostly stable. Capitalists form the clearest stratum throughout, followed by professional workers and small employers, with the other fractions being rather spread across the range of incomes.

During the 1990s, and particularly with the end of high inflation, privileged class positions became much clearer strata. The overlapping coefficient of capitalists went from 0.34 to 0.21, from 1992 to 1999, during which period that of small employers went from 0.66 to 0.62 and of professional workers from 0.55 to 0.53. The overall measure of stratification, G_B/G_{BP} , increased from 0.58 to 0.61 (where 1 indicates perfect stratification). Once again, this indicates that the transition to neoliberalism in Brazil had the effect of normalising accumulation and reorganising class relations in ways that strengthened social hierarchies.

From 2003 to 2013, on the other hand, overall stratification (G_B/G_{BP}) decreased from 0.60 to 0.57, driven by changes within fractions of workers. With greater formalisation, low-skilled, formal workers became less of a stratum, increasing their overlapping coefficient from 0.84 to 0.88.[6] Pro-

[6] This is almost exclusively due to their numerical increase, as the individual group-by-group indices are almost constant.

fessional workers lost the most distinction, however, as their overlapping coefficient rose from 0.52 to 0.60 – an increase of almost 20%.[7] This indicates that distinctions between different categories of workers grew more blurred throughout the decade, reducing overall class inequality. At the same, capitalists remained a clear stratum, and small employers also became more demarcated. This latter point, which stands in opposition to the developments for professional workers, supports the argument that the distribution that took place under the PT governments did not confront capital, the possession of which became a stronger guarantee of social standing, but only relations between workers.

An overall assessment of the movements of class inequality can now be offered. The 1990s saw an increase of class inequality, driven by informalisation and greater returns to capital and other privileged class fractions, as well as higher class stratification. These results were tempered by a slight decrease of within-group concentration towards the end of the decade. This latter trend would then accelerate during the 2000s, as class inequality also fell. The main drivers of this were labour formalisation and narrower income gaps between professional and informal workers, as well as greater pension coverage. The relative income of formal workers remained constant, however, which can be related to a growing concentration of positions paying between one and two minimum wages, and the income of capitalists was mostly preserved. It should be highlighted that these conclusions – i.e., that the redistribution of income was restricted to developments amongst workers, whereas capital-based income was preserved – are not contradicted, but rather reinforced, by tax returns. As seen in section 2, Medeiros and Castro (2016a) show, for example, how capital income accounts for 39% of inequality amongst the richest 10% of the population in 2012, growing from 26% in 2006.

5. ACCUMULATION AND INEQUALITY

This article now explores how the decrease of inequality between 2003 and 2013 was connected to the country's pattern of accumulation. This is done by relating the main conclusions of the preceding section to an analysis of the drivers of growth, of the sectoral distribution of employment, and of the main constraints the economy faced, i.e., managing inflation and assuring long-term balance-of-payments solvency.

Two propositions are made. The first, following Rugitsky (2016), is that during this period there was a cumulative causation mechanism connecting growth, distribution and structural change. Rising income in the bottom of the distribution led to greater demand for wage-goods, which, as they were produced domestically, increased the demand for low-skilled labour and hence the wage

[7] It is beyond the scope of this work to investigate what social and identitarian repercussions this loss of status and privilege might have implicated for the traditional middle-class in Brazil. It is, nevertheless, a demonstration that this group increasingly had to share spaces with the ascending lower classes, perhaps suggesting some measure of *déclassement*, and was the one that gained the least during the 2000s.

of these workers, reinitiating the cycle and improving the distribution of income. The second proposition is that this eventually led to a conundrum, it becoming impossible to balance growth, redistribution, monetary stability and balance-of-payments solvency under an ongoing regressive structural change and with an already-overvalued currency. To overcome this, deeper sources of inequality – such as the tax system and capital income – would have to be addressed and bolder industrial policies put in place.

The argument is laid down in three steps. First, analysing the institutional sources of demand – household consumption, investment, government expenditure and exports – it is shown how growth was an internally-driven process, with household consumption taking the lead. This allows for a focus on domestic factors as the proximate determinants of growth. The second step then looks into the productivity and wage schedule of the sectors that grew the fastest and generated the most employment. It is shown how these are mostly sectors that pay average wages close to or below the mean, whose goods and services are geared to the consumption of workers and with low productivity. This establishes, respectively, the labour market roots of the redistribution process, the cumulative causation process linking growth and redistribution, and the regressive structural change in place. Finally, the third point concerns the limits to this process, namely the incapacity of balancing growth, redistribution, inflation stability and balance-of-payments solvency without a change of policies.

5.1. Domestically-driven growth and income distribution

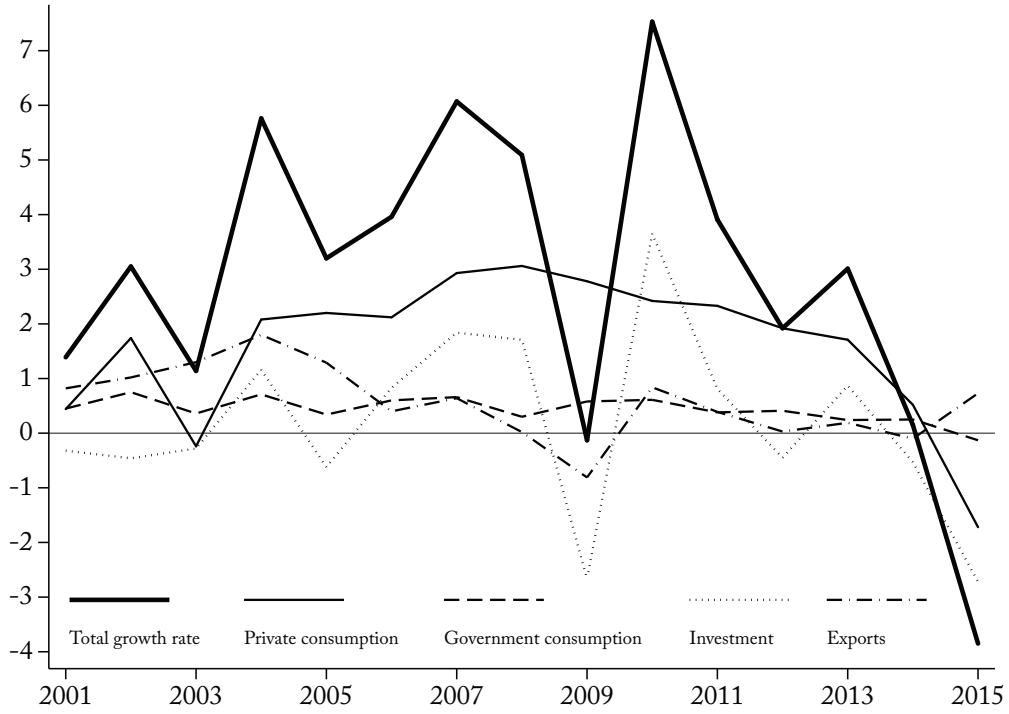
Brazil experienced a considerable growth surge from 2003 to 2013, which can be divided into two phases (see Table 2). The initial uptick was caused by higher commodity export prices, raising the growth rate from 1,1%, in 2003, to 5.8% in 2004. This was later succeeded by an internally-driven process based on income redistribution, public investment and induced private investment. This led to an average growth rate of 4.4% from 2006 to 2011, after which it steadily declined until 2015, when output decreased by 3.8% (Ipeadata).

Table 2 Average contribution of different sources of demand to the growth rate of GDP in Brazil for selected sub-periods, 2003-2013. Estimates net of their impact on imports.

Period	Private consumption (% of total)	Government consumption (% of total)	Investment (% of total)	Exports (% of total)	Total GDP growth rate (% of total)
2003-2005	1.3 (40%)	0.5 (14%)	0.1 (2.6%)	1.5 (43.5%)	**3.4 (100%)**
2006-2013	2.4 (61.4%)	0.5 (12.1%)	0.8 (21%)	0.2 (5.4%)	**3.9 (100%)**

Source: Prepared by the authors based on data by Souza Júnior (2016).

Figure 7 Contribution of different sources of demand to the growth rate of GDP in Brazil, 2001-2015. Absolute contributions net of their impact on imports.



Source: Prepared by the authors based on data by Souza Júnior (2016).

As shown in Table 2, between 2003 and 2005 output growth was mainly driven by the autonomous rise of exports, which responded for 43.5% of aggregate demand. This is the first component to rise substantially (see Figure 7), contributing with 1.3 points of total growth in 2003, when both investment and private consumption were falling. Export volumes increased 63.7% between 2001 and 2005, and prices 24.2% (Ipeadata).

This rather fortuitous uptick in demand initiated a growth cycle whose drivers would soon change. Exports, between 2006 and 2013, contributed with a measly 5.4% of total GDP growth. They were superseded by private consumption (61.4% of the total, or 2.4 points per year) and investment (21.0% of the total), with government consumption also relevant (12.1% of the total). This was a domestic-led growth cycle, but exports and capital flows also played a role as they displaced the balance of payments constraint: foreign currency availability rose from approximately 50 billion USD in 2005 to 350 billion in 2011 (BCB 2016), providing an important safety cushion.

The centrality of household consumption and investment in the cycle allows for disregarding the impact of government consumption and exports as autonomous drivers of demand. It is thus a matter of identifying the dynamics of investment and household consumption, both as regards their autonomous elements and their endogenous responses. The latter is done in the next sub-section.

Regarding consumption, three sizeable elements might be considered autonomous drivers of demand: greater credit, rising minimum wages and increased social security-related transfers. Household indebtedness rose considerably during this period, from 18.4% of disposable income in

January 2005 to 41.8% in December 2011 (or from 15.3 to 31.1% excluding mortgages), after which it stagnated or decreased (BCB 2016). This was based on both a deepening of debt levels for households previously included in the financial sector as well as, to a large extent, an extension of credit instruments to new consumers – between 2005 and 2010, the share of households with credit cards increased from 15 to 25%, for those with an average income of up to 3 minimum wages, and from 30 to 43%, for average incomes between 3 and 5 minimum wages (Lavinas 2015).

Rising minimum wages were another of the main drivers of private consumption, both directly and indirectly, as their real value grew upwards of 70% from 2003 to 2013. This had considerable impacts on the labour market, particularly its lower-paid segments, as the minimum wage is always the modal income. The greater compression of low-skilled wage around the minimum wage, as seen above, strengthened this channel.

The impact of a higher minimum wage extends much further than the labour market, however, as several social security benefits and state pensions are linked to it. Orair and Gobetti (2010) indicate that between 2002 and 2010 government transfers to households, comprising state pensions, social security and unemployment benefits, CCTs such as PBF and similar programmes, rose by almost 2 p.p. of GDP. Importantly, almost 40% of this increase can be attributed to rising minimum wages. Brito et al. (2016) estimate an even higher contribution of the minimum wage to the decrease of inequality, between 60 and 70%. Therefore, higher values for benefits, increased coverage and the creation of new programmes combined to considerably increase the income of the poorer sections of the population, autonomously increasing demand.

Finally, private investment can be taken as an effect induced by the growth process itself. Recent studies about the determinants of investment in Brazil (Santos *et al.* 2016b, Santos *et al.* 2012) have highlighted two main points: that there is a strongly complementarity between public and private investment, and that the latter is very closely tied to the growth rate of output. Private investment should thus not be considered, in this scenario, an autonomous source of demand: '[t]he private component of investment in machinery and equipment is basically driven by the need to adjust the stock of capital to trend growth in effective demand' (Serrano and Summa 2015: 24).

5.2. The cumulative causation of growth, redistribution and regressive structural change

Having established that growth was domestically driven, with household consumption playing the leading role, this subsection now explores how the autonomous drivers of demand (rising MWs, credit and social security transfers) spurred a cumulative causation process connecting growth, distribution and (regressive) structural change. This is based on the 'inside-out miracle' Rugitsky (2016) proposed.[8]

[8] Its name comes from the inversion of the 1970s process that linked higher demand for durable goods to demand for the professional employment to produce it, which, in a situation of poorly distributed education, increased inequality.

National accounts show that, between 2003 and 2013, total employment increased by 18.8 million. Of the 51 activities discriminated in the national accounts, 13 increased their employment by more than 500 thousand. Ten of these are in the private sector, and respond for 82.1% of the net employment generated. The analysis will thus consider these ten activities (see Table 3).

Table 3 Net employment generation, wages and labour productivity for sectors that generated more than 500 thousand net jobs between 2003 and 2013, Brazil

Sector	Net employment generation, 2003-2013 (% of total)	Relative average wages, 2013	Labour productivity, 2013 (relative productivity)	Difference in labour productivity, 2003-2013
Food and beverages	811531 (4.3)	1.17	20.8 (0.98)	5.0
Machinery and equipment	521311 (2.8)	1.63	27.5 (1.3)	-10.7
Construction	3155522 (16.8)	0.65	15.8 (0.74)	3.8
Sales	3310280 (17.6)	0.69	15.8 (0.74)	6.6
Transport and storage	1009452 (5.4)	1.06	21 (0.99)	7.2
Lodging services	764174 (4.1)	0.4	10.2 (0.48)	4.4
Services provided to businesses	2658210 (14.2)	1.15	24.9 (1.17)	0.2
For-profit education	1083537 (5.8)	0.95	11.7 (0.55)	-6.3
For-profit health	955434 (5.1)	0.85	19.1 (0.9)	-0.5
Services provided to families	1139652 (6.1)	0.58	9.3 (0.44)	1.2
Total private	**15409103 (82.1)**	**0.78**	**16.3 (0.77)**	**3.6**
Public education	1229444 (6.6)	2.01	22.6 (1.06)	4.9
Public health	700341 (3.7)	2.24	25.2 (1.19)	1.3
Public administration	1285860 (6.9)	3.17	39 (1.84)	2.2
Grand total	**18767336 (100)**	**1**	**21.2 (1)**	**3.7**

Source: Prepared by the author based on National Accounts data
Notes: labour productivity in thousands of 2003 Brazilian reais per worker per year, deflated by the implicit GDP deflator when the evolution is shown. Wages include benefits.

First, it can be seen that only one sector (machinery and equipment) has an average wage substantially above the overall mean wage (1.63 times higher), and its contribution to job creation was modest (2.8%). Five other sectors are close to average wages, and four substantially below. Taken together, the relative average wage of these ten sectors is of 0.78. This confirms the first link, namely that *employment grew mostly in low-paid sectors, and hence the higher clustering of the income of low-skilled workers between one and two MWs as noted above*.[9]

[9] It should also be noticed that the relative mean wages of for-profit education, a sector with a high share of professional workers, decreased considerably, from 1.76 to 0.95. This also aligns with the loss of relative of professional workers previously indicated.

Second, with the exception of services provided to businesses and machinery and equipment, the other sectors are services, the demand for which comes mostly from workers. Food and beverages, sales, lodging, services provided to families and for-profit health and education stand out, indicating that rising income at the bottom of the distribution increased the demand for wage-goods. Construction can be partially be taken along the same lines, given the importance of the popular housing programme *Minha casa, minha vida* (My house, my life), which, since 2009, has contracted 4.6 million houses. This thus confirms the second link, that *the driver of demand for domestic output was the growth of income at the bottom of the distribution*.

Third, these are mostly low-productivity, domestic-orientated sectors. Only machinery and equipment was above the economy-wide labour productivity, at 1.3, but marred by a decrease of minus ten thousand reais per worker per year (in constant 2003 reais) over the analysed period. Together, the labour productivity of these ten sectors was 23% below the average of the whole economy in 2013, and their overall increase was similar to the average. This thus confirms that *the structural change cumulative causation initiated was regressive, spurring low-productivity services*.

In sum, this subsection has shown how the pattern of inequality reduction in Brazil was closely connected to the pattern of accumulation of the economy. The main facts that came out of the Gini analysis were i) that the decrease of inequality was driven by changes within categories of workers, particularly labour formalisation and lower relative income for professional workers, and ii) that this came accompanied by a clustering of wages between one and two MWs. It was shown how this is explained by the increase of low-paid sectors, alongside public policies that stimulated low incomes. This income hike, in turn, stimulated the demand for wage goods, particularly services. As the output of the latter increased, the lower-skilled sections of the labour market were heated, increasing employment, formalisation, wages and, again, the demand for wage goods.

This self-reinforcing process indeed decreased income inequality and maintained fast growth for a certain period. However, it led to regressive structural change, and did not generate highly-paid jobs. The next subsection explores how this would gradually cement limits for its own continuity in inflationary pressures and the dependence on high international commodity prices.

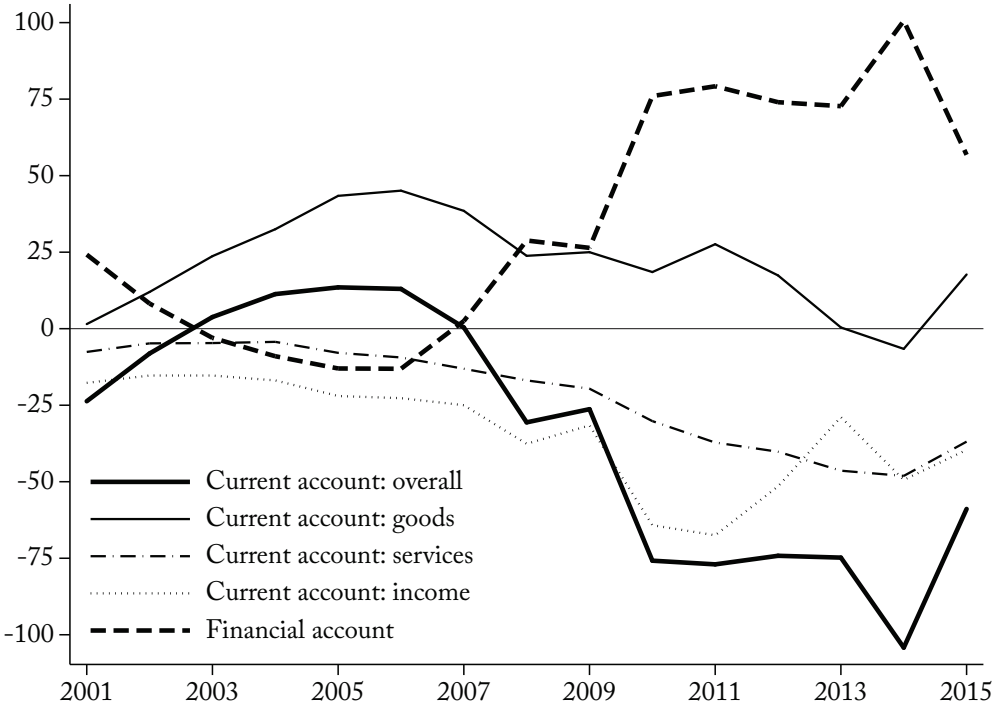
5.3. The exhaustion of the growth and redistribution process

To identify the limits of the 'inside-out miracle' two further determinations are necessary: the dynamics of inflation and the country's global insertion. These reveal how wage gains in services escalated cost-push inflation and how regressive structural change furthered the dependence on high international commodity prices to assure mid-term balance-of-payments solvency.

As shown in Figure 8, the current account and the balance of trade in goods both peaked in 2006, with surpluses of 13 and 45 billion US dollars, and then underwent a steady period of decline. Only a constant influx of capital, upwards of 70 billion USD in most years after 2009, prevented a

deterioration of foreign solvency. Although the balance of trade in goods remained moderately positive, the increase in exports that occurred after 2006 is mostly due to price changes, as the volume index vacillates by 5% around its 2006 level until 2014 (Ipeadata). Imports, on the other hand, increase in volume by almost 90% between 2006 and 2013. In other words, the very growth process itself brought about a weakened insertion in the world market.

Figure 8 Select balance of payments accounts for Brazil, 2001-2015. Net values in US$ billion



Source: Prepared by the author based on data from Ipeadata.

Two main factors explain these negative developments: the stagnation of the Brazilian productive structure and overvalued exchange rates. Although the existence, nature, and causes of deindustrialisation in Brazil is hotly debated, the literature does provide sufficient agreement for the purposes at hand.[10] Catching up to global players is an insurmountable mid-term requirement of any development strategy, and there is no real disagreement that it did not happen. As shown above, the main sectors responsible for growth were domestically-orientated, low-productivity sectors.

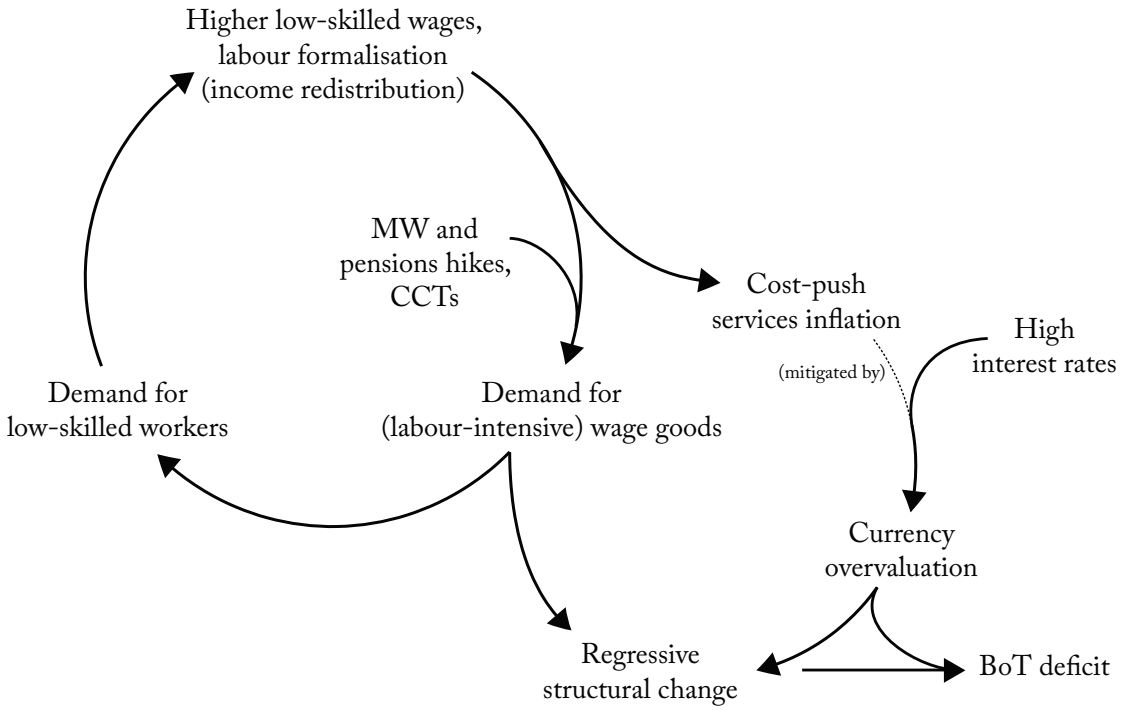
Furthermore, whether an overvalued exchange rate was or not the *main* mechanism, it did skew profitability against export-orientated sectors. It also reduced the competitiveness of domestic producers of tradable goods, hence spurring the increase of employment in services. In fact, the nominal exchange rate appreciated almost continuously between 2003 and 2011, going from a year-average of 3.08 BRL/USD to 1.67 (Ipeadata), forestalling domestic tradable sectors.

[10] See Nassif et al. (2015) for a recent overview of the debate. Roughly, there are two camps, which argue that manufacturing was consistently dismantled because of an overvalued exchange rate (Bresser-Pereira 2012, 2013, Oreiro *et al.* 2012) or that it merely fell behind by not adapting to global manufacturing networks and value chains (Baltar *et al.* 2016, Corrêa and Santos 2013, Hiratuka and Sarti 2015, Santos *et al.* 2015).

In sum, the productive structure of the Brazilian economy fell behind and loss competitiveness during the 2000s, creating structural supply problems and making export income essentially dependent on commodity prices. This process could only be reverted via a combination of wide-ranging industrial policies and a competitive real exchange rate.

Maintaining a competitive real exchange rate would, however, spike inflation. After a low point of 3.1% in 2006, inflation rose and has since 2008 remained consistently above the official target of 4.5. Studies have shown that excessive demand was not, *per se*, an important cause of inflation. Wage gains – through their impact on the costs of services – were amongst the main determinants, on the other hand (Braga 2015, Giovannetti and Carvalho 2015, Santos *et al.* 2016a). It thus obtains that the growth and redistribution process was also inherently inflationary, and would require countervailing measures to ease this constraint.

Figure 9 Mechanisms of growth, redistribution and regressive structural change in Brazil



Source: Prepared by the author.

The following conundrum thus obtains, illustrated in Figure 9. The 'inside-out miracle' provided growth and redistribution in a cumulative causation pattern, shown in the upper-left part of the figure. Initially spurred and then accelerated by MW hikes and government transfers, demand for wage-goods rose, increasing the demand for low-skilled workers to produce them. This raised their wages and led to labour formalisation, one of the main redistribution mechanisms and the central driver of growth. This inherently led to limitations, however, shown in the bottom-right of the figure. Such wage-goods were in low productivity service sectors, subject to cost-push inflation and the increase of which implied a regressive structural change. The latter was furthered by the main

mechanism put in place to combat this endogenous inflationary pressure, namely, high interest rates used to attract foreign capital and overvalue the exchange rate.

This schematic presentation of inequality and accumulation in Brazil highlights two limitations that would not be observable if the processes were taken separately. The redistribution of income exhausted itself not in its own terms, but rather as it created constraints in terms of inflation and the international insertion of the economy. This is centrally related to it having been confined to changes amongst categories of workers, preserving the position of capitalists. *Continuing to redistribute income would thus require expanding beyond the limited basis of the process that took place*, such as confronting capital returns, the tax structure and the holding of public debt. The analysis also shows how *growth and redistribution were dependent on the commodities boom*. The latter guaranteed, whilst it lasted, mid-term solvency to the balance-of-payments and provided foreign reserves. This allowed for the exchange rate to appreciate as an inflation-controlling mechanism, in spite of this being a process with a clearly limited time frame.

Taken together, these two elements – the restricted nature of the redistributive process and the ultimate dependence of continued accumulation on the commodities boom – show the limitation of the changes Brazil underwent. The cycle exhausted itself, without creating the conditions for new processes of redistribution or growth to take place. It would have been necessary to prepare more transformative actions, which could expand income distribution beyond the labour market or transform the international insertion of the economy, but these were not forthcoming.

6. Conclusion

This article has taken an integrated approach to income inequality and capital accumulation in Brazil, analysing the 1992-2013 period. It has contributed by indicating the class dimension of inequality and explaining the interrelation between inequality and accumulation. Based on this, it has shown the growth and redistribution phase of the 2000s exhausted itself.

Regarding inequality, neoliberalism led to labour precarisation, sharper class stratification and higher income gaps. The 2000s in turn saw positive developments, mainly in the form of labour formalisation and higher relative income for low-skilled, informal workers, alongside better-distributed pensions. A growing concentration of income between one and two MWs could also be observed. The relative income of capitalists was not affected, however, and control over capital became a more efficacious form of climbing the social ladder vis-à-vis control over scarce skills. This highlights the limited basis of the redistributive process.

It was then shown how low-productivity, service sectors selling wage goods grew between 2003 and 2013. This implied a cumulative causation between higher income at the bottom of the pyramid, higher demand for wage goods and higher demand for low-skilled workers, in turn leading to labour formalisation and higher wages for the latter, feeding back on the cycle – the ‘inside-out

miracle' Rugitsky (2016) proposed. This also led to regressive structural change, as it increased the share of low-productivity sectors, and spurred cost-push inflation in services sectors.

Finally, it was shown how it was *the connection between inequality and accumulation that spelled the major constraints for both*. Redistribution based on increasing wages in services would become a constraint as it could not continue to stimulate growth without creating inflationary pressures, whilst, on the other hand, the growth process brought about growing trade deficits. This made the *commodities boom an enabling condition of the process*, as it was the only way to guarantee mid-term balance of payments solvency. *Growth and inequality reduction thus supported each other during a period, but also created their own shortcomings that, to be overcome, would require bolder distributive actions and deeper transformations of the productive structure*.

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8. APPENDIX

Table 4 Brazilian household per capita income inequality, 1992-2013, decomposition by class position (ANOGI method): Gini coefficient, its subcomponents and their share in total inequality

Year	G	G_{IG}	G_{IGO}	G_{BP}	$G_B - G_{BP}$	G_{WO}	G_B	$\frac{G_B}{G_{BP}}$	$\frac{G_{WO}}{G}$	$\frac{G_B}{G}$
	I	I	I	I	V	V	V	V	I	X
		I	II	V		I	II	III	X	
1992	0.584	0.504	-0.110	0.327	-0.138	0.394	0.190	0.579	0.675	0.325
1993	0.605	0.524	-0.118	0.340	-0.141	0.406	0.199	0.586	0.671	0.329
1995	0.602	0.510	-0.119	0.345	-0.134	0.391	0.211	0.613	0.650	0.350
1996	0.604	0.519	-0.114	0.333	-0.134	0.405	0.199	0.598	0.670	0.330
1997	0.603	0.513	-0.120	0.344	-0.133	0.392	0.211	0.614	0.650	0.350
1998	0.602	0.512	-0.121	0.347	-0.135	0.390	0.212	0.612	0.648	0.352
1999	0.595	0.503	-0.117	0.343	-0.135	0.387	0.208	0.606	0.650	0.350
2001	0.593	0.506	-0.122	0.343	-0.134	0.384	0.209	0.610	0.647	0.353
2002	0.587	0.502	-0.111	0.326	-0.131	0.391	0.196	0.600	0.666	0.334
2003	0.581	0.496	-0.113	0.328	-0.130	0.383	0.198	0.604	0.659	0.341
2004	0.570	0.490	-0.109	0.318	-0.129	0.381	0.189	0.596	0.668	0.332
2005	0.567	0.486	-0.109	0.318	-0.127	0.376	0.191	0.601	0.663	0.337
2006	0.560	0.479	-0.110	0.316	-0.125	0.370	0.191	0.604	0.659	0.341
2007	0.553	0.479	-0.099	0.295	-0.123	0.380	0.172	0.583	0.688	0.312
2008	0.542	0.470	-0.096	0.291	-0.123	0.375	0.167	0.576	0.691	0.309
2009	0.538	0.466	-0.100	0.293	-0.121	0.366	0.172	0.588	0.680	0.320
2011	0.525	0.458	-0.091	0.275	-0.116	0.367	0.159	0.577	0.698	0.302
2012	0.522	0.457	-0.093	0.273	-0.115	0.364	0.158	0.579	0.697	0.303
2013	0.521	0.455	-0.092	0.276	-0.117	0.363	0.158	0.574	0.697	0.303

Source: Prepared by the author based on data from the PNAD, 1992-2013.