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Macro or micro? Class analysis and the drop of wage inequality in Brazil from 1981 to 2007

Paper prepared to the Summer 2009 Meeting of the RC28
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July 2009

1 – Introduction[1]

Income and wage inequality in Brazil are among the highest in the world[2]. Fortunately, after a period of steady growth (especially during the 1980's) this picture started to change, since the last decade income inequality began to decline to the point that today it is in its lowest values after 25 years. Two processes are important to understand the phenomenon: the control of inflation achieved in 1994, and changes in the educational composition of the population (Ferreira et al, 1998, 2001 e 2006). Focusing on education we observe that educational inequality within the labor force, and returns to investment in human capital have decreased, what accounts approximately to 40% of the recent drop in wage inequality between 2001 and 2005 (Barros et al, 2006b). Moreover, other important features accounting for this decline are a relative homogenization of the age composition of the population – which is linked to diminishing differences in returns to work experience (Barros et al, 2006c) – and a convergence between rural and urban income (Ferreira et al, 2006) – which narrowed the historically large gap in wages between rural and urban areas.

Although these explanations about the decline in wage inequality are valid, some sociologists have added another important aspect overlooked by economists: the relation between wage inequality and the class structure.[3] Some studies suggest that social classes are highly correlated to income in Brazil. These studies also show that wage inequality between classes – and not only between individuals – also diminished between 1981 and 2001 (Ribeiro, 2007; Silva, 2003b). Unfortunately these studies do

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[2] During the 80's and 90's, for example, the average Gini index for the *per capta* family income in Brazil was 80% larger than the average of OCDE counties and 20% larger than the average of other latin American countries (Ferreira, heterogeneidadE). By the and of the 80's only Guatemala and Honduras had indexes of income inequality similar to the brazilian in Latin America; in spite of this fact, in the same year, the ratio between the average income of the richest 10% and the poorest 40% of the population in Brazil was the worst in a ranking of 55 countries (Barros et al, 1997). Even in 2004, after the triggering of the drop in income inequality, Brazil had the 10th position in a world-wide income inequality rank (Banco Mundial, 2005).

[3] Jose Alcides Figueiredo Santos (2000) is one of the few scholars dedicated to this type of study, where he develops a sociolocial critique to the neo-classical approach and shows how class structure is involved with income inequality. Other brazilian scholars also studied the theme, but restricted to specific years, without long time trends, like Silva (2003b) and Costa Ribeiro (2007).

not take advantage of the large amount of data containing information on both income and occupations. Most analyses stop in the year of 2001 and use only a maximum of four surveys. This is unfortunate because the drop in income inequality have been more consistent and significant after 2001, and the year by year tracking of inequality is potentially more informative to understand the exact moments in which inequality trends reverse. Furthermore, the sociological studies use highly aggregated social classes' schemes, which reduce hundreds of occupations to less than twenty class categories. Although we understand the logic and validity of this aggregation practice; recently some authors proposed a methodology and theory to test the interplay between wage inequality, disaggregated occupations (micro classes) and aggregated class schemas that we intend to test using the case of declining inequality trends in Brazil (Grusky and Galescu, 2005).

Besides testing this theory and methodology, our approach is useful both to the economists' and sociologists' debate on income inequality in Brazil. Despite being neglected by economists studying the Brazilian case, social classes and occupations are important variables in the explanation of wage inequality trends, since boundaries between occupations and jobs' characteristics directly affect the type of labor relations and the rewards obtained by workers (Sorensen & Kalleberg, 1981; Erikson & Goldthorpe, 1992). In other words, a sociological understanding of the process that constitutes income or wage inequality has to deal with the fact that the labor market operates through occupations, or more specifically some sociologists would suggest, through classes.

In addition, we also wish to understand the impact that wage distribution could have on the class structure itself. This could happen in two ways: first, through changes in the shape of wage distributions among individuals inside each occupation; and second, through changes in income inequality between different occupations aggregated into a class category. The key question to the analysis of income inequality we are proposing in this paper is the following: what is the relation among (1) intra-occupational inequality, (2) intra-class between occupations inequality, and (3) between classes inequality? The present debate about this subject can be divide as follows: i) economists who are only concerned about inequalities between individuals and families, ii) scholars – such as John Goldthorpe and Erik Olin Wright – who see class,

understood as a theoretical aggregation of occupations, as a fundamental step to the understanding of the structuration of inequalities in general; and iii) a new perspective proposing the analysis of micro classes in order to test for the possibility of intra-class heterogeneity present when macro classes are used.

Therefore, in this paper we intend to answer the following questions about income inequality in Brazil. Are the differences between occupations becoming more important in the country? Did the drop of wage inequality in Brazil diminished the distance between macro classes? What is the contribution of the intra-occupational income dispersion to total income inequality? Therefore, we will try to address these questions, focusing on wage inequality between men and women from 1981 to 2007.

2 - Micro or macro classes?[4]

One strong tradition in sociology is to use macro classes (aggregation of occupations based in some theoretical principles) to study processes of class closure and its effects on stratification processes (Erikson & Goldthorpe, 1992; Wright, 2005)[5]. Recently, this strategy has been criticized precisely because the aggregation of occupations has been considered as a form of hidden the very processes of closure that are intended to be the focus of analysis. Proponents of a micro-class approach suggest that processes of closure can only happen at the micro-level of occupations, and therefore they should be studied using some analyses of occupational structures at a disaggregated level (Grusky & Galescu, 2005).

The scholars linked to the micro class perspective argue that the aggregation of occupations into large class categories is "disrespectful" to the heterogeneity of

[4] Due to both a lack of space and the existence of abundant references, the theoretical discussion of this section is focused in sociological approaches to class analysis. We did not focus the important economic debate about income inequality reproduction among individuals and families, human capital theories, among others (Becker, 1976).

[5] We must remember that, besides class analysis, there are other approaches to social stratification that conceive inequalities in a continuum, taking as a inequality measure occupations prestige or socioeconomic indexes. This approach became popular since the classical publication of Blau and Duncan (1967), *The American Occupational Structure*.

occupations. Once it leaves a whole range of important occupational attributes unanalyzed – for example, the relation between identity and occupation or the different capacities for collective action that exist between occupations (Grusky & Weeden, 2001; Grusky & Weeden, 2005). According to the micro class approach, these very important processes – which ultimately are what we should call "closure mechanisms" – could only be captured with a reorientation in class analysis towards a realistic level, where social groups are formed around functional niches according to the social division of labor, in other words, the occupational level. This perspective would have the virtue of substituting the nominal categories of the macro class approach, by a more "realistic" approach, rooted in meaningful social institutions not only to scholars, but also to the lay public (Grusky & Sorensen, 1998).

The realistic and institutional rooted characteristic of occupations is a consequence, mostly, of the fact that social closure strategies – like credential or licensing requirements – do not operate in the macro class level, but rather on the occupational level. The aggregation of heterogeneous occupations into macro classes mix occupations deeply involved in the creation of boundaries with those that have an incipient involvement with this type of strategy, or do not have this type of strategy at all (Grusky & Weeden, 2001). From an analytical perspective this highly aggregated strategy would be negative because an important aspect of labor market structuration is the understanding of mechanisms associated with the generation of *rents* (Sorensen, 2005). In other words, a class analysis focused on the occupational level is potentially more complete, since it can handle the connections between a handful of features traditionally associated with class structure, like the building of identities, class consciousness and conflict, life chances and social closure strategies (Grusky & Sorensen, 1998; Grusky & Weeden, 2001; Grusky & Galescu, 2005).

The theory, however, admits that the "occupationalization" may not be complete. Grusky recognizes that, in certain cases, occupational associations may not emerge, in virtue of the competition of other associational forms (centralized unions, for example) or simply the non viability of collective organization (Grusky & Galescu, 2005: 63). Other important feature is that ethnic, racial or gender differences may influence the development of a disaggregated form of structuration, even in cases in which the occupationalization has experienced expansion. This approach has no

ambition to propose that occupations are the only means of influencing, for example, salary determination (Weeden, 2002).

One important feature of the micro class approach is its intimate connection with the take off of American income inequality, especially in the last 30 years. Between 1983-85 and 2000-02, for example, the Theil Index for labor income in the United States rose approximately 19% (Kim & Sakamoto, 2008: 137). Basically, this theory tries to handle the growth in income inequality in general, what supposedly would have a direct connection with occupational closure and the rise of wage returns to occupations on the top of the labor market hierarchy. Until now, the empirical evaluation of these theories has been ambiguous. Departing from similar methodological backgrounds Kalleberg & Mouw (2006) and Kim & Sakamoto (2008) have reached opposite conclusions: the former propose that the rise in American income inequality is connected with a handful of occupations, while the later conclude that the major explanation of the same phenomenon is the rise of intra-occupational inequalities.

In spite of the divergences, what seems relevant in the micro class approach is the possibility to test different hypotheses related to historical trends of the relationship among income distribution, the occupational composition and class structure. The joint analysis of these three features would allow us, on the one hand, to evaluate if changes in income inequality contribute to “occupationalization” or to “class structuration” or to “individualization” (or diminishment of structuration) in the Brazilian context. On the other hand, it would be possible to know in what measure changes in the occupational and class structure have been affecting the wage distribution during the last years. In the end, the issue of “occupationalization” versus “class structuration” versus “individualization” is an empirical question and must be addressed in all its complexities. This is exactly what we pursue in this paper.

3 – Wage and Income Inequality in Brazil.

The empirical debate about income inequality in Brazil started in the 1970’s, when reliable data became available and was firstly used by Fishlow (1972) and

Langoni (1973)[6]. Since then, an extensive literature has been produced (Figueiredo Santos, 2000; Soares, 2002; Silva, 2003b) leading to some knowledge of clear trends across the last decades. During the 1960's and 1970's, when the country was experiencing fast and steady industrialization and economic growth, income inequality grew considerably. Between 1960 and 1980, the proportion of income amassed by the richest 20% of the population rose from 54% to 63% of the total, while the income of the poorest 40% of the population dropped from 12% to 10% of the total (Barros et al, 1997). Income inequality continued to grow during the 1980's – when there was economic stagnation – and was specially high from 1989 to 1993. While since 1993 income inequality became to decline consistently, it was after 2001 that it experienced its most significant drop (Ferreira et al, 2006). All studies on Brazilian income inequality report the declining trend using different indexes and measurements of income, such as family income, income per capita, or wages. Wage inequality is special important because it is the most influential in defining income inequality as a whole, since wages account for 76% of total family income (Barros et al, 2006b).

As previously mentioned, the most important mechanisms explaining the drop of income inequality in Brazil are inflation control, the declining returns to education, changes in the population's educational composition, and the urban-rural income convergence (Ferreira et al, 2006; Foguel e Azevedo, 2006; Barros et al, 2007).

Although these evidences presented until today are strong, we believe that a more consistent and thorough use of occupational variables could be extremely useful to make sense of the observed trends.[7] We suggest that the use of occupational variables is particularly relevant because of the heterogeneous characteristics of the Brazilian economy, which combines modern industry and services with more traditional sectors in rural, services and industrial activities. But we also propose an inverse argument, that

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[6] These authors tried to understand the mechanisms that affected inequality: the first highlited the importance of labor market and political factors linked to the military government of 1964, which promoted repression for the workers and also inflation mechanisms to help the country's growth; the second pointed to the educational heterogeneity of the country and the return structure as the most important explanation of inequality.

[7] We have several analyses demonstrating the relevance to use occupational variables to understand rent extraction in the brazilian labor market, but these works focuses just one year (Figueiredo Santos, 2000) or two (Silva, 2003). Here, we will focus in a longer time sequence, 26 years, or 23 data bases, as previously mentioned.

is, instead of observing only the impact of occupational and class structures on trend of income inequality we can investigate the impacts of the decline in income inequality on changes in the occupational and class structure. In other words, we can understand in what measure the changes in income inequality is leading the Brazilian class structure to occupationalization or micro class structuration, to macro class structuration or to a fragmentation of the occupational and class structure. This is equivalent to focus on the structure or shape of inequality, instead of looking only to its level.

Therefore, we intend to contribute to the debate about income inequality in Brazil by determining the relations between occupational variables and wage inequality during the last 25 years.

4 – Hypotheses

First, we would like to test in what measure class (defined by occupational categories aggregated or not) remains an important concept to understanding the most recent trends in the Brazilian labor market. Since previous research report a significant relation between income inequality and classes for years before 2001, we are sure that classes remain associated to income in the following years. We intend, however, to advance in relation to previous research by focusing not only on the association between class and income, but also on the shape of this association. Sociologists studying the U.S. have been pointing out a rise in the internal heterogeneity of classes and occupations towards a consolidation of a "winner-takes-all" society, due to a greater variance in the employers characteristics (big corporations living side by side with small employers), the informational uncertainties, the fall of internal labor markets and the larger returns associated to those at the top positions within some occupations (Frank & Cook, 1996; Kim & Sakamoto, 2008). Inspired by these examples, we want to test if some sort of increasing variation within occupations and class categories has been happening in Brazil, and therefore in what measure the nature of the class/occupation/income association is changing.

In addition, we would like to use the Brazilian case to discuss the validity of David Grusky's micro class perspective and critique to aggregation of occupations into

macro classes. We are particularly interested in checking the plausibility of relating income and occupations in the Brazilian context. According to the micro class approach the between occupations component of the income/occupation/class association must not only have a considerable weight, but also become increasingly important due to a specialization of the labor market and a greater demand for qualified professionals. A weaker approach inspired by the same theory would need to confirm only the first part of the previous sentence, that is, the between occupation component must have considerable weight. We would be less rigorous with the second part of the hypothesis since the rise in specialization and technological innovation dynamic is not as strong in the Brazilian context as it is in the United States or other places[8]. Besides that, occupationalization processes do not seem plausible in Brazil, according to previous sociological research. The Brazilian labor market passed through a process of deep changes, with the extinction of various positions and a period of high rates of unemployment during the 1990's, a process specialists attribute to the adaptation of our economy to international standards or what they call a productive restructuration (Cardoso, 1999; Baltar, 2001). However, the first part of the hypothesis – an expectation of considerable contribution of the between occupations component to the total income inequality – seems to be valid due to the history of labor market institutionalization in Brazil. Although the Brazilian economy is marked by deep heterogeneities – with a large amount of the labor force located in the informal sector, with low productivity and specialization – we must recognize that since 1930, the consolidation of the social and labor legislation has privileged the organization of labor around professions – and not industries, for example – with fixed geographical bases. These and other historical facts lead us to consider the validity of Grusky's theory – at least in its weakest form, highlighting the contribution of the between occupations component trend – against the Brazilian context.

5 – Data and methodology

[8] As it can be demonstrated in the second attachment, the classes of professionals of high and low level presented a modest growth in the years evaluated.

Our analyses are based on 24 data sets of the *Pesquisas Nacionais de Amostragem Domiciliar* (Brazilian National Household Survey, Pnads hereafter). The sample we selected is nationally representative and includes men and women from 25 to 64 years old, except those without income from labor. These options leave us with a mean sample of 98,000 cases per year.

The class scheme we use was the one proposed by Costa Ribeiro (2007) which is an expansion of the 12 classes CASMIN schema based on another Brazilian class schema proposed by Silva (2003a). The class schema we use makes more distinctions within the manual working classes, since this seems to be particularly important to understanding the Brazilian labor market, in which the large majority of workers are still in manual working occupations. In the second annex to this paper we show the evolution of the size of classes for men and women between 1981 and 2007.

Our measure of income or wage inequality is the variance of the natural logarithmic of the individuals' main work income or wage. We are aware that this measure is not scale invariant (Cowell, 1977), therefore we use an inflation index that accounts for price variation in a range of consumer goods such as food, energy, rents and others (IPCA, calculated by the Brazilian Bureau of the Census) to standardize the income distribution for each year to the income values of July 2008.

In 2002 the Brazilian Bureau of the Census (Instituto Brasileiro de Geografia e Estatística – IBGE hearafter) changed its occupational codes, following instructions of the International Labor Office to adopt the International Standard Classification of Occupations (ISCO). The problem is that the new occupational codes are not directly compatible with the previous one, and IBGE did not propose an official standardization for the two codifications. We had to elaborate this standardization ourselves. For macro classes our tests are consistent and indicate that there are no considerable ruptures between 2001 and 2002. However, it is impossible to match occupation by occupation at the disaggregated level. So, the graphics we present below are always split in two periods (1981-2001 and 2002-2007), when disaggregated occupations are analyzed. In the regression models for each period we included only occupations present in all years analyzed, so that we could be sure that our results were not influenced by changes in the occupational structure. As a consequence, in the analyses for the first period (1981-2001) we included 196 occupations for women, 280 occupations for men and 316

occupations for both, while in the second period (2002-2007) we included 291 occupations for women, 414 occupations for men and 431 occupations for both.

Men and women were analyzed separately because of gender differences in labor market participation. In Brazil, since 1980 women have experienced a major rise in participation in the labor market. For example, from 1981 to 2006 the proportion of women who were heads of household increased from 16.4% to 29.8%.

The analyses below are based on a decomposition of the variance of the residuals from a series of linear regressions on the logarithm of the income per hour of work. These models have as independent variables either the macro classes or the occupations maximally disaggregated. Using the results from these models a decomposition of the regression residuals was made by applying the following equations, based on Weeden et al (2007):

$$\mathbf{Var_{BC}} = \frac{\sum_{i=1}^{N}(y_i-\bar{y})^2}{N-1} - \frac{\sum_{i=1}^{N}\left((\hat{y}_i|c_i-y_i)-\overline{(\hat{y}_i|c_i-y_i)}\right)^2}{N-1},$$

$$\mathbf{Var_{IC/BO}} = \frac{\sum_{i=1}^{N}\left((\hat{y}_i|c_i-y_i)-\overline{(\hat{y}_i|c_i-y_i)}\right)^2}{N-1} - \frac{\sum_{i=1}^{N}\left((\hat{y}_i|o_i-y_i)-\overline{(\hat{y}_i|o_i-y_i)}\right)^2}{N-1},$$

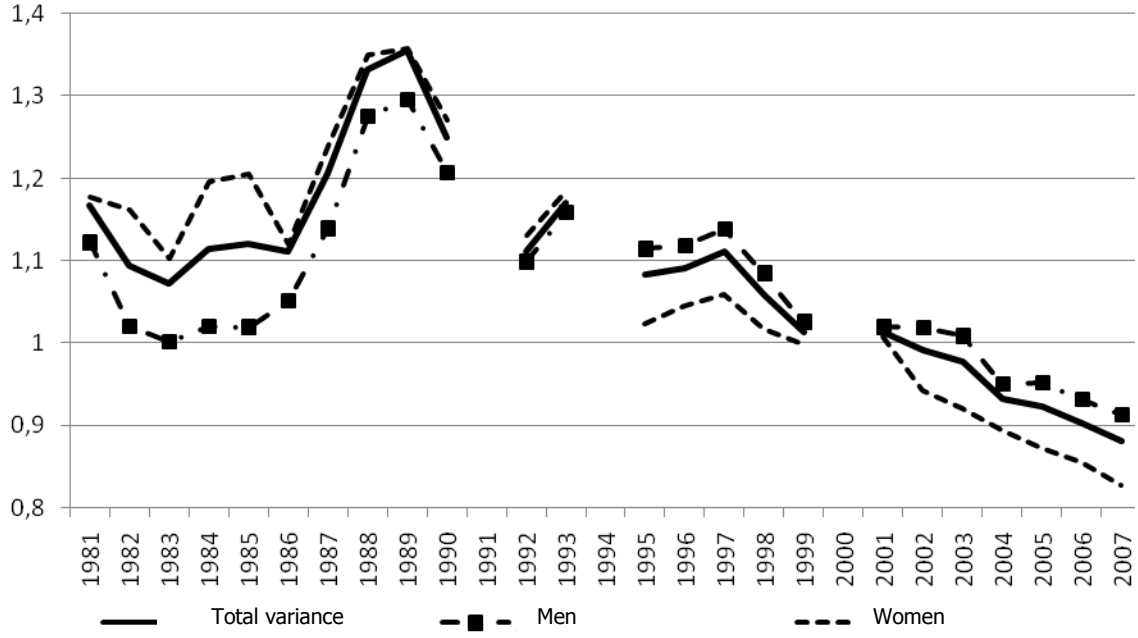
$$\mathbf{Var_{IO}} = \frac{\sum_{i=1}^{N}\left((\hat{y}_i|o_i-y_i)-\overline{(\hat{y}_i|o_i-y_i)}\right)^2}{N-1},$$

Where c_i stands for a vector of dummy variables that represent the macro class of individual i; o_i is a vector of dummy variables that represents the occupation of individual i; and N is sample size. In a first step, section 6 below, we use these equations to obtain three components of income inequality: ***between classes (BC), intra-class between occupations (IC/BO)*** and ***intra-occupations (IO).*** In a second step, section 7 below, we apply these decompositions to two sub-samples for the manual and non-manual occupations respectively (excluding occupations linked to property in the rural and urban sector). In a third step, section 8, we make a simple decomposition of the internal inequality to a selected set of class groups.

6 – Trends of income inequalities between classes, intra-classes between occupations, and intra-occupations

In Graphic I we present the total variance of the logarithm of the wage per hour of work in Brazil from 1981 to 2007. The results are consistent with the tendencies observed in previous research: (1) rise until the end of the 1980's, (2) volatility between 1989 and 1993, (3) decline from 1993 onward, and (4) more accentuated decline after 2002. The first issue that stands out is the similarity between men's and women's wage variance. Along the years, with female participation in the labor market increasing women's income inequality became less pronounced than men's. We will discuss this issue further below.

Graphic I – Variance of the logarithim of the income of labor per hour of work (values corrected for July 08). Pnads 1981-2007

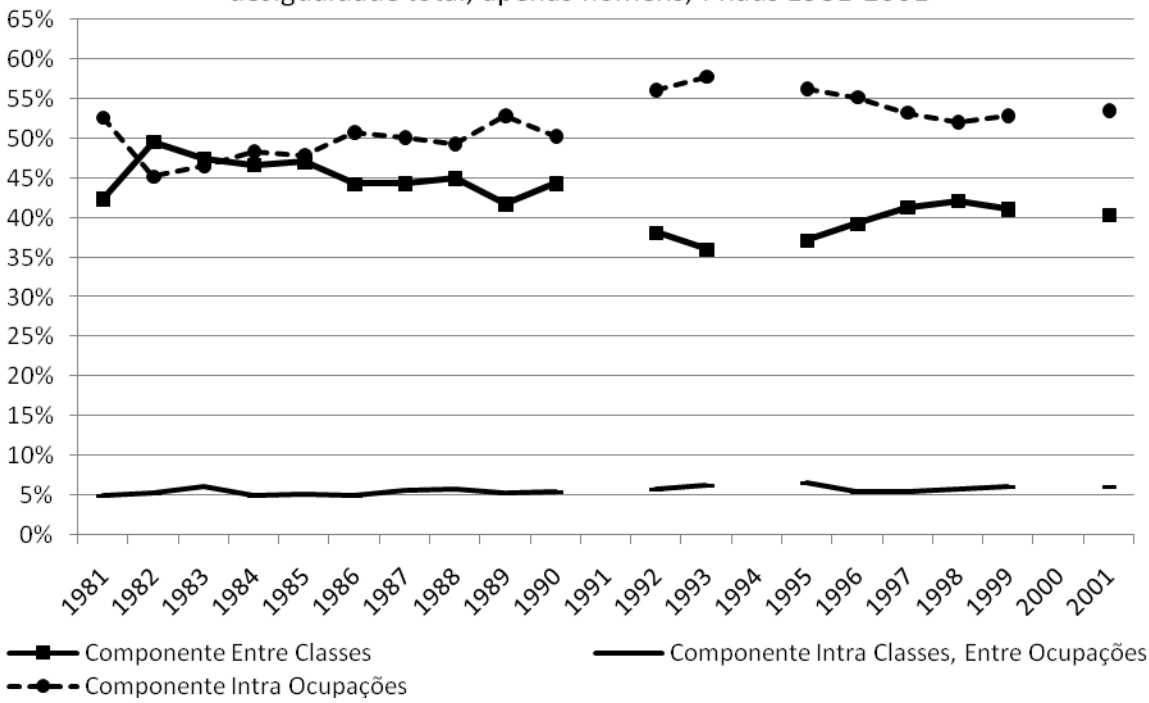


Graphics IIa and IIb illustrate the first decomposition of variance for men. First, it is important to mention that we decided to plot the axis in percentage, because like that it is easier to see the contribution of each component to the observed decline in wage inequality during the years studied. If the weak hypothesis about micro classes is robust enough to describe the trends in Brazilian income inequality, the intra-class between occupations (IC/BO) component should have a significant weight. This does

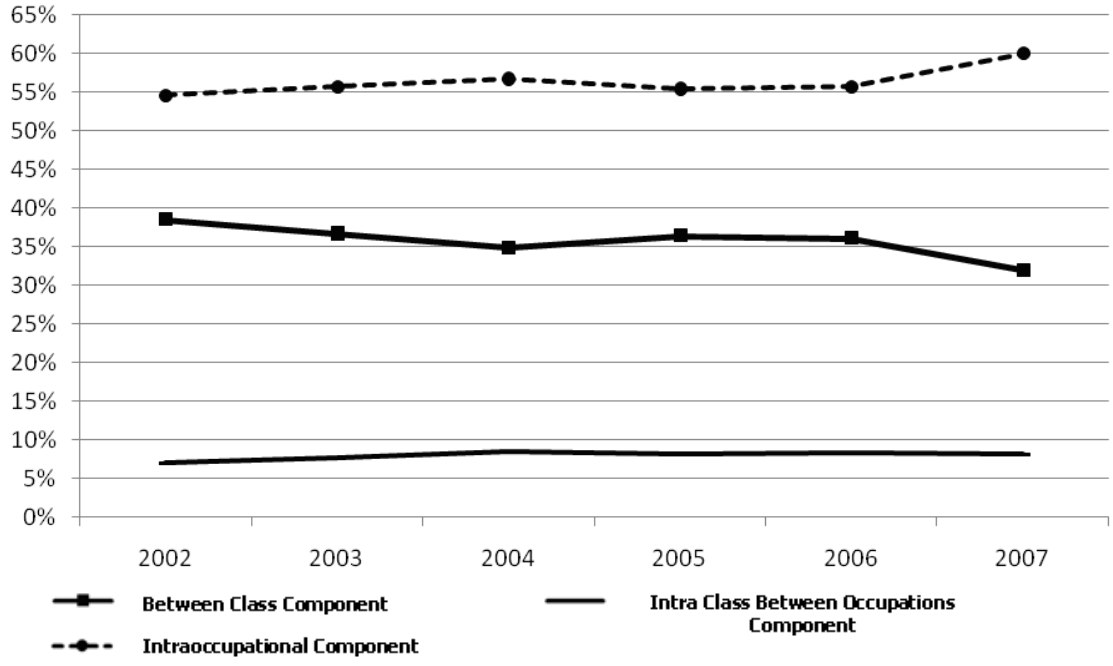
not happen, because the IC/BO component does not have much importance throughout the years studied, although it has shown a little rise in the last 10 years. So, we can conclude that the between classes (BC) and intra-occupational (IO) components account for most wage inequality observed. We note a small overlap between the BC and IO components during the 1980's, while in the following decade the intra-occupational component became more important, and the between classes component lost its weight.

However, it is difficult to correlate these changes with general income inequality trends. The intra-occupational (IO) component surpasses the between classes (BC) component by the end of the 1980's – when income inequality reached its peak – continuing to be higher until 2007. Moreover, this trend is even clearer during the present decade, when all the indexes of income inequality are indicating the most significant fall ever observed in the country. In sum, Graphics IIa and IIb reveal, on one side, that the intra class between occupations (IC/BO) component is constant and almost irrelevant along the years, and, on the other side, that as the intra-occupational (IO) component increases across time, the between classes (BC) components decreases. In fact, what Graphics IIa and IIb show is that between classes inequality is still relevant, although it had been decreasing its explanatory value in relation to other components across the years. Since 2002 the absolute value of the between class component (BC) has experienced a linear negative trend, with a fall of 4.3% per year, while the total income inequality, also experiencing a negative trend, have been diminishing only by 2.1% per year .

Gráfico IIa. Contribuição percentual de cada componente para a desigualdade total, apenas homens, Pnads 1981-2001



Graphic IIb. Components weight to total income inequality. Men. Pnads 2002



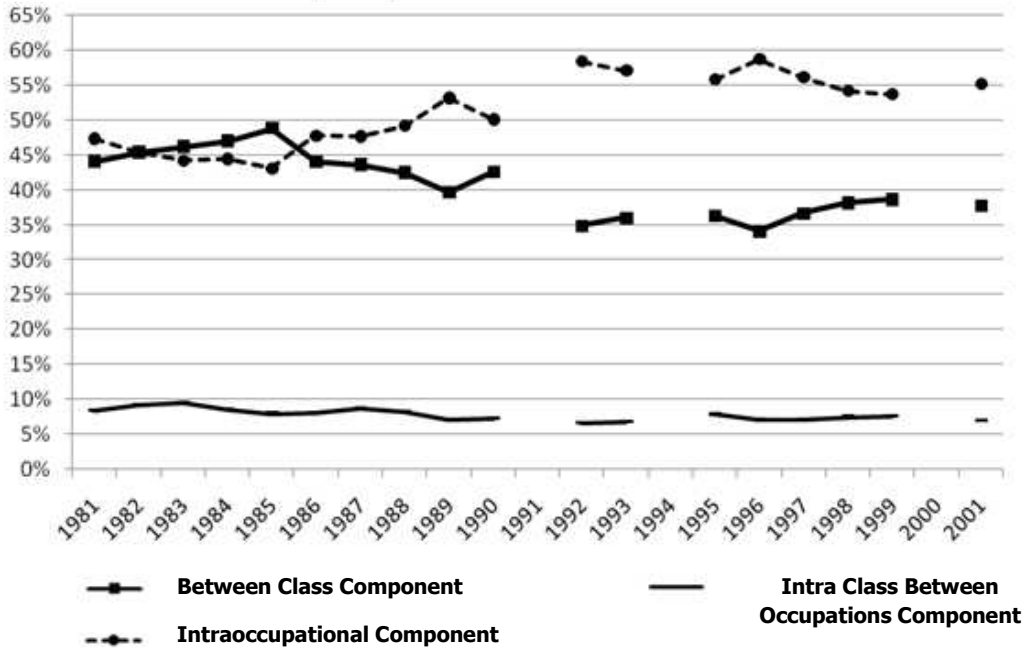
Graphics IIIa and IIIb repeat the same analyses for women. Similar to men, women's wage inequality not only is related mostly to the *between class* (BC) and the *intra-occupations* (IO) components, but also follows almost exactly the same pattern of trends. Likewise, since 2002 there has been a rise of the *intra-occupations* (IO) component and a decrease of the *between class* (BC) component. The income inequality *intra-classes between occupations* (IC/BO), also has less importance compared to the other components, although for women there is more oscillation on this component than for men. Moreover, we observe a process of convergence between men and women: the *intra classes between occupations* (IC/BO) component had more weight for the later than for the former in particular during the 1980's – from 1981 to 1988 the relative weight was 3% bigger for women than for men – but there is no gender difference afterwards – both men's and women's IC/BO component fluctuates around 8%. This was expected, since the increasing participation of women in the labor force had as a consequence a decline in the polarization among female occupations, since women have been increasingly entering in all types of occupations.

The results for the second period (2002-2007) are exactly the same as those observed for men. The absolute values of the *between classes* (BC) component decreased by 4.4% per year, a negative trend more intense than the negative trend of total wage inequality, which experienced a 2.4% decrease in the same period. In contrast, the *intra-occupations* (IO) component decreased by 1.2% per year.

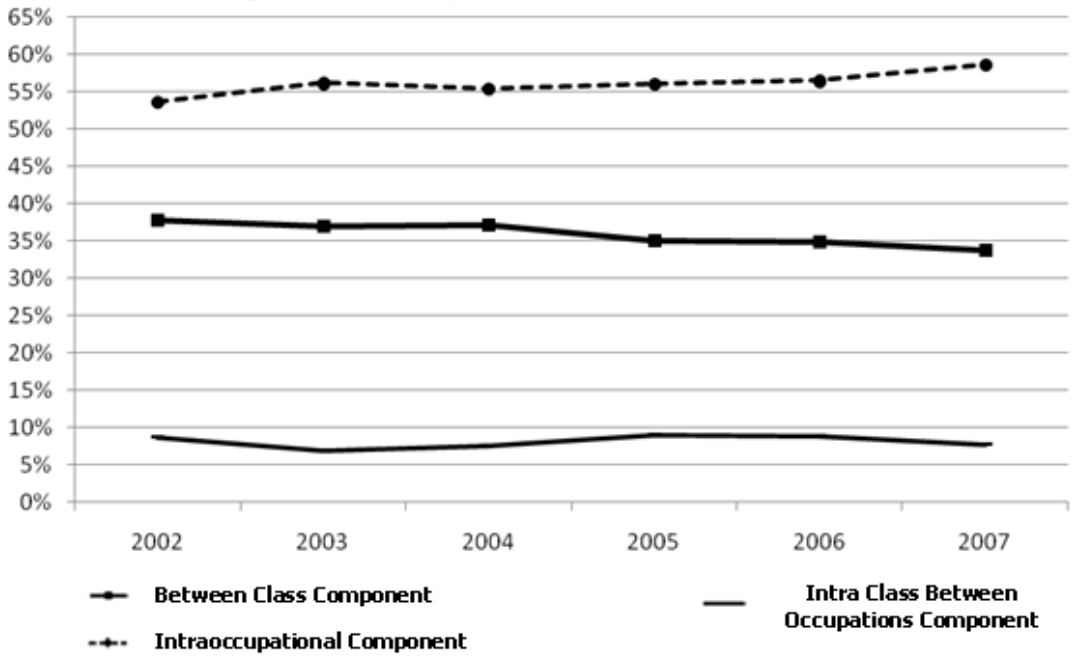
In sum, trends of wage inequality indicate – for both men and women – that the *intra-class between occupations* (IC/BEO) component does not have a significant weight. Furthermore, the *between classes* (BC) component, although relevant throughout the period, starts to decrease its importance in comparison to the *intra-occupations* (IO) component by the second part of the 1980's. This last trend preceded the opening of commercial barriers and the productive restructuration which characterized the Brazilian market reform during the 1990's. The analyses of these trends lead us to conclude that: although macro classes remain important throughout the

period, they seem to be moving to an heterogeneous situation. In other words, if macro classes continue to lose importance in explaining wage inequality, we would observe a regime of individualized inequality in Brazil. This means that the country is moving towards a situation in which features such as experience, age and human capital will probably have more weight than individual's occupations.

Graphic IIIa – Components weight to total income inequality. Women. Pnads 1981-2001.



Graphic IIIb – Components weight to total income inequality. Women. Pnads 1981-2001



7 – Decomposition of inequalities within manual and non-manual classes

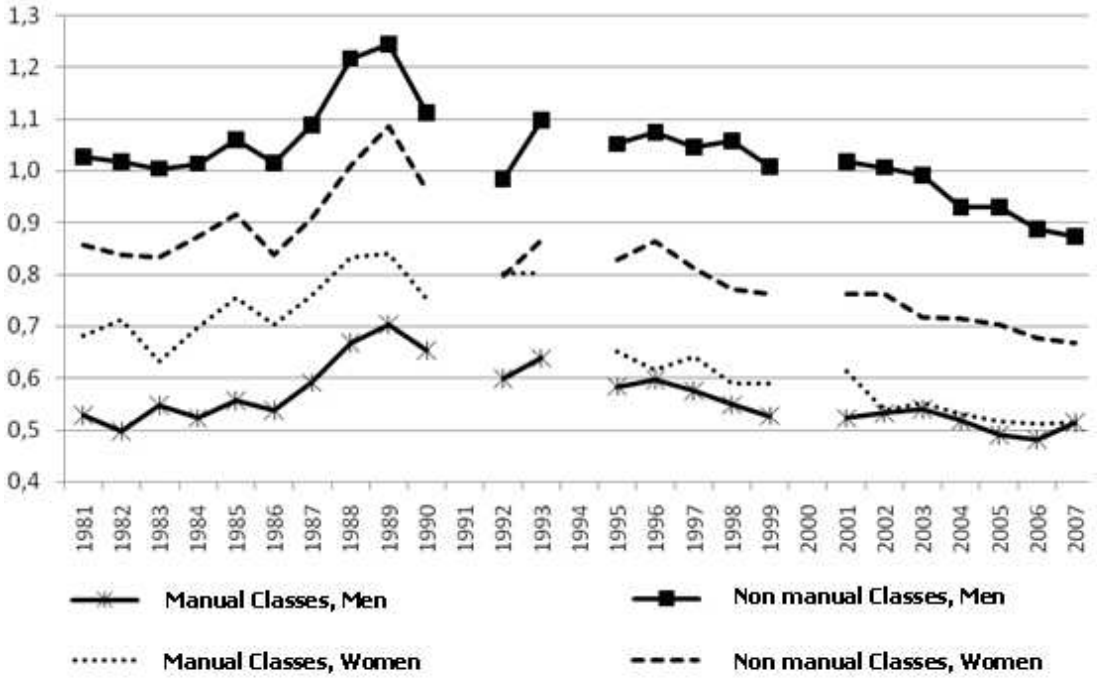
It is plausible to ask if the general patterns identified above are masking trends in the opposite directions. Indeed, Weeden et al (2007) argue about the possibility that the occupationalization might be advancing in the specialized sectors of the labor force and decreasing in the manual classes. To test this hypothesis, we developed two strategies: one presented in this section and the other one in the next section.

As a first strategy, we applied the same decompositions presented in the previous section to one set of workers in the non-manual and non-property urban classes[9] and another set in the manual classes[10]. Graphic IV displays trends of internal inequalities: the highest internal inequalities are found when we select men in non-manual classes. The average internal inequality in non-manual classes is 84% larger than in manual classes for men and just 26% for women.

[9] That is, individuals in the administrative and professionals, high and low levels, and also routine non-manual workers of high and low levels (supervision, office and services).

[10] Individuals of the manual classes in general.

Graphic IV – Internal income inequalities: non-manual and manual classes. Men and Women.



In addition, we decomposed internal inequalities in the four groups above[11]. Within non-manual classes for men, the *between classes* (BC) component decreases from 35% to 30% between 1981 and 1990 and remains around these values from 1990 and 2007. The *intra-class between occupations* (IC/BO) component shows stability, oscillating around 11% throughout the period. And, finally, the *intra-occupations* (IO) component rises from 53.7% to 57.8% between 1981 and 1990, and fluctuates around 60% between 1992 and 2007. In the non-manual classes for women, the *between classes* (BC) component, *intra-class between occupations* (IC/BO) and the *intra-occupations* (IO) component fluctuate randomly around, repectively, 25%, 11.5% and 63% throughout the period.

Among the manual classes, the picture is a little different: for men, the *between class* (BC) component falls from 21% to 8% between 1981 and 2001, remaining stable around 6% between 2002 and 2007; what made this component become less important than the *between occupations* (IC/BO) component, which has a variation around 13.5%

[11] Não incluímos os gráficos destas decomposições para economizar espaço. Eles podem ser obtidos com os autores.

between 1981 and 2001 and 16% from 2002 to 2007. The *intra-occupations* (IO) component rises from 64.7% in 1981 to 76.2% in 1992 and, from this point on, fluctuates around 78% until 2007. Finally, among women, the *between class* (BC) component falls from 8% to 5% from 2001 onward; and the *between occupations* (IC/BO) component also decreases, with an average of 20% from 1981 to 1985, 16% between 1986 and 1990, 13% between 1992 and 2001, and 9% between 2002 and 2007[12].

Analyzing the trends of manual and non-manual classes we can conclude that the *between occupations* (IC/BO) component does not show any significant rise, with one exception: the strong stability among women's manual classes, in which this component lost weight during the period analyzed. Furthermore, among all the groups analyzed this component shows an insignificant weight, around 10%, and curiously, if there is any occupationalization in Brazil it is among the manual classes.

In addition, it is important to hightlight that the differences between macro classes are becoming less important throughout the years. Among the manual classes, the component that represents wage inequality attributed to aggregated ocupations became almost irrelevant during the last years: accounting only for 6% of internal inequalities for both men and women. However, among the non-manual classes, the differences between macro classes are still significant, accounting for at least 30% of internal inequalities among men and 25% among women. On the first half of the 1980's this number was around 35%. In sum, it is only among non-manual classes for women that the weight of the between classes component does not follow a significant negative trend.

Finally, the differences among manual classes became almost irrelevant through the years. In these classes, the *intra-occupations* (IO) component has more weight than in the non-manual classes, since its size has risen considerably for men during the 1980's. This was expected, since we are aware that manual classes are constituted by workers without much specialization and with informal links to the labor market, what puts them outside the spheres of official labor regulations. The workers of non-manual classes have less intra-occupational heterogeneity probably due to their capacity to

[12] The difference between the 90's and the 2002-2007 time sequence must be interpreted cautiosly, since it can be entirely accounted to a change in the occupational classification of the data.

promote social closure strategies and to estabilish formal relations within the labor market. However, even among these – at least among men – the *between classes* (BC) component drops during the 1980's, but remains stable during the 1990's.

8 – Decomposition of internal income inequalities for each class

Even with all the evidences presented so far, one can still argue that the manual/non-manual separation is not sufficient to identify occupationalization trends. Therefore, we decide to implement still another decomposition for some selected categories of macro classes separating the *between occupations* (IC/BO) and *intra-occupations* (IO) components. If at least the weakest hypothesis about occupationalization is suitable to the Brazilian case, it would be possible that the more specialized classes have a distinct – and more intense – pattern of inequality. The implementation of this second step of our investigation consists in a new set of regression models, in which only the individuals of each macro class are selected. This regressions use the logarithm of wage per hour of work as dependent variable, and dummies for occupations within each macro class as independent variables. The internal inequality of each class can be decomposed into a *between occupations* and *intra-occupations* components, so that the R^2 of the models implemented correspond to the proportion of internal inequality explained by the first component[13]. It was not possible to implement these models for women because – especially in the 1980's – the number of women in the labor market was still small. As a consequence, we have a problem of small N's leading to highly volatile results for women[14].

Since the hypothesis of occupationalization does not apply to occupations linked to property or to rural manual workers, we excluded individuals in these groups from our samples for the present analyses. We also excluded small classes (with small Ns) in

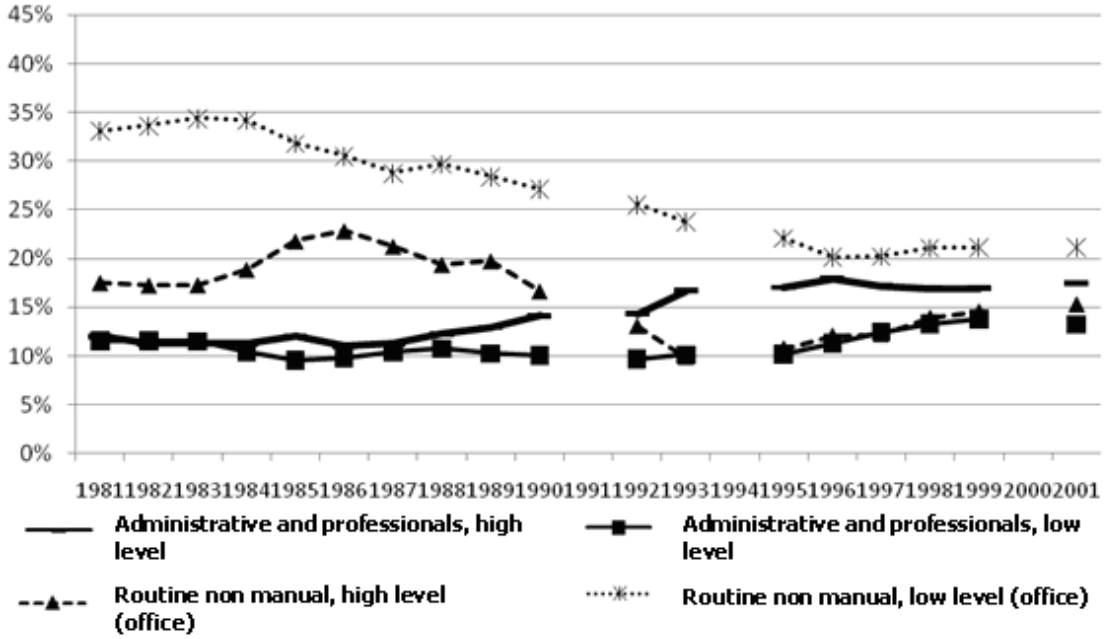
[13] Naturally, with a simple operation like $(1 - R^2)$ we reach the relative weight of the intra-occupations component.

[14] Among women many classes did not reach 200 or 300 cases, what explains the fluctuation of the R^2. As the calculated values of R^2 only account to the samples in which they were calculated, without any correspondent population parameter (which leads to criticisms such the one of King, 1986), it is not possible to bypass this obstacle through the use of confidence intervals, for example. For women, the best way to behave seems to be an aggregation of several data bases, merging several years. Unfortunately, we did not have time to implement that strategy.

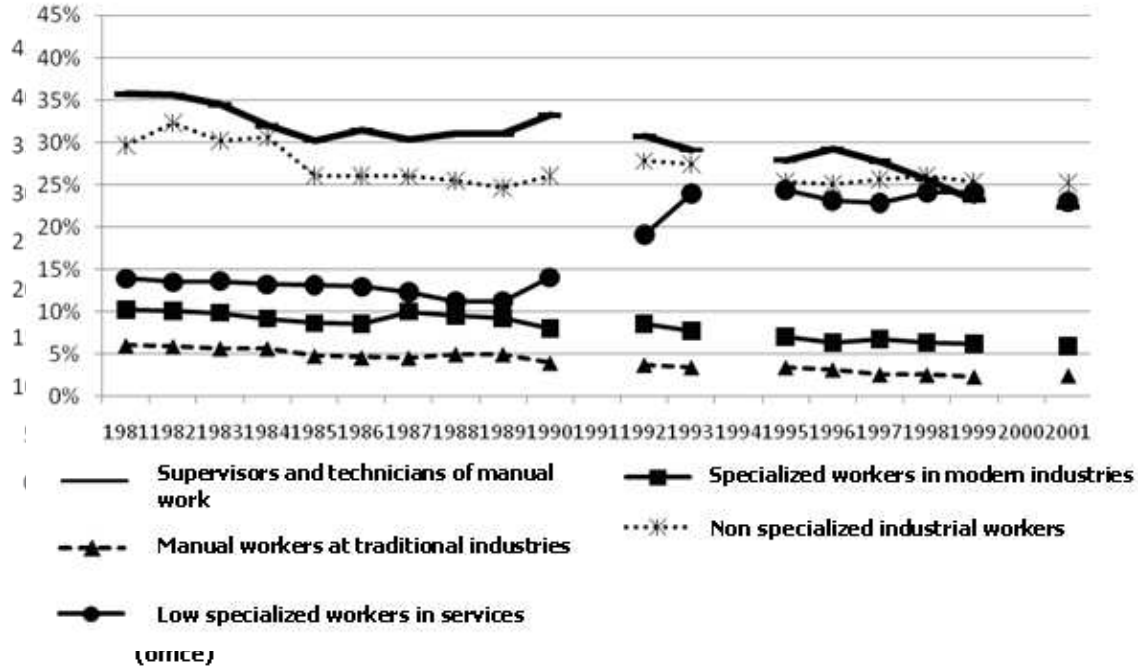
order to avoid volatility in the analysis of the trends[15]. Graphics Va, Vb, VIa and VIb present the results of these decompositions: each graphic displays the three years average of the proportion of "between occupations inequality" within each class.

[15] We did not include classes with less than 2% of valid cases from 1981-2001 and 2002-2007.

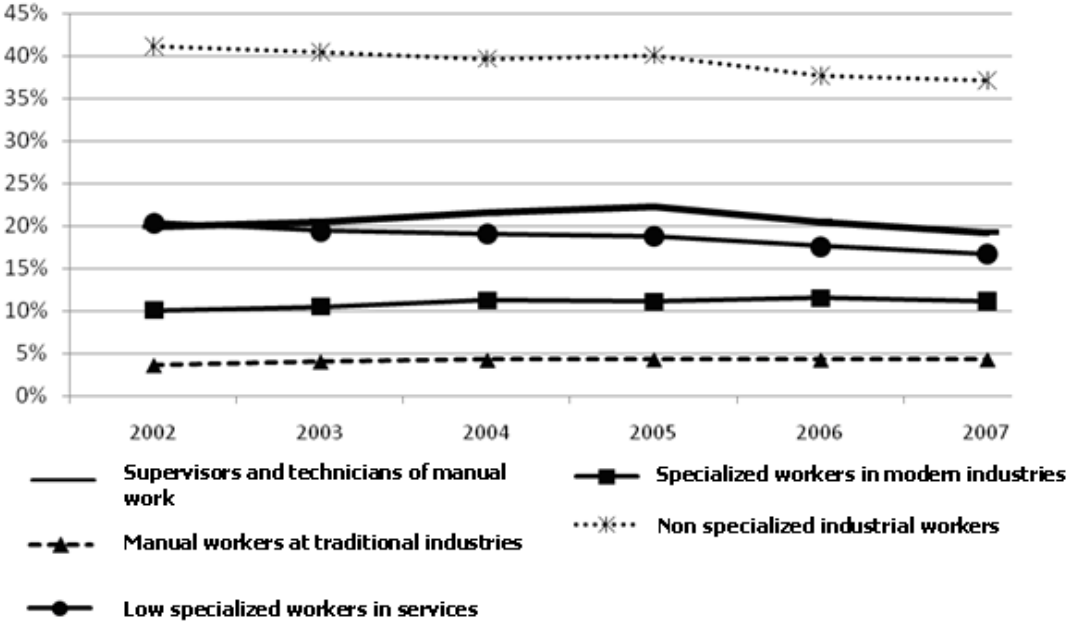
Graphic Va – Dynamic three annual average of the proportions of internal inequalities associated to differences between occupations. Non-Manual classes. Men. Pnads 1981 - 2001



Graphic VIa – Dynamic three annual average of the proportions of internal inequalities associated to differences between occupations. Manual Classes. Men. Pnads 1981 - 2001



Graphic VIb – Dynamic three annual average of the proportions of internal inequalities associated to differences between occupations. Manual Classes. Men. Pnads 2002 - 2007



Graphs Va, Vb, VIa and VIb indicate that in non-manual classes there is a strong process of “de-occupationalization” among both high and low level routine non-manual workers beginning in the 1980’s and ending in the mid 1990’s, whereas between 1995 and 2001 the *between occupations* component increased for lower level routine non-maual workers. Therefore, since the mid 1990´s this process led to a convergence among non-manual classes’ levels of inequality, with the *between occupations* component accounting for something around 15% and 20% of the total inequality. In contrast, the more specialized classes (administrative staff and professionals, high level) became more occupationnalized between the end of the 1980’s and the middle of the 1990’s, although this classes did not have the between occupations component with high levels in none of the years analyzed.

Finally, Graphs VIa and VIb reveal diverging trends for the manual classes. On one side, between 1981 and 2001 the intra class between occupations (IC/BO) component of inequality not only was small for manual workers in traditional and modern industry, but also present a declining trend. On the other side, during the same years, the contribution of this component (IC/BO) was large for technicians and supervisors of manual work and for non specialized industrial workers. How can these divergent trends be interpreted? We think that this is a consequence of two process related to a “de-occupationalization”: (1) one among classes that were not marked by significant occupational differences, and (2) another one among classes in which this component was strong. Finally, the trend in the percentage of the *between occupations* component of inequality can be divided in two periods: one before 1990, in which the between occupations component is small and non-significant; and another one, after 1993, in which it is high and significant. The changes of occupations’ codes previously mentioned affect our analyses, as we can see in the graphics for the 2002-2007 sequence, but even considering this change in classification it is possible to identify the continuos “de-occupationalization” process among the non-specialized workers in industry, side by side with a certain stability in the other classes.

The conclusions that can be drawn from the analyzes of the graphics are the following:

i) there are important differences in the process of occupationalization between the non manual and manual classes, as we predicted;

ii) however, the classes with bigger earnings and more specialization are not more occupationalized;

iii) even more, since 2000 the classes in which the between occupations component had more weight were three manual classes (supervisors and technicians of manual work, non specialized industrial workers and low specialized workers in services, all three with a component around 25%) whereas among non-manual classes some convergence can be identified around 15% and 20%;

iv) although it is not possible to neglect the weight of the between occupations component in certain cases we cannot over estimate its importance, because the intra-occupations component is always stronger and does not seem to have any trend in the between occupations component that can change this picture.

Even the processes linked to occupationalization seem to have an episodic and short term shape. However, at least two classes – routine non-manual high level (office) and technicians and supervisors of manual work – have experienced a "de-occupationalization" process of long term that made the *between occupations* component drop more than 10% between 1981 and 2001.

9 – Discussion and conclusion

We followed three steps in order to make sense of the relationship between the decline in wage inquality and the class structure in Brazil. Our main goal was to test a theory of micro classes claiming that occupational differences can account for a large part of income inequality trends (Weeden, 2002; Weeden et al, 2007). The first step was to decompose the variance of wage per hour of work into three components: *between classes* (BC), *intra-classes between occupations* (IC/BO) and *intra-occupations* (IO). Our analyzes informed that, both for men and women, the *between occupations* (IC/BO) component shows stability and is pratically irrelevant to explain inequality trends. In contrast, the *between classes* (BC) and the *intra-occupations* (IO) components are

strongly associated with inequality trends. While the intra-occupational (IO) component had increasing importance in explaining inequality since the end of the 1980's, the *between classes* (BC) component had decreasing gradually its importance during the same period. These trends suggest that, although in the last 15 years the absolute values of the three components were decreasing, the between class differences is dropping in a much faster way than intra-occupational inequality. In other words, in relation to other components intra-occupational inequality accounts each time more for the observed levels of wage inequality.

After identifying these trends we moved to our second step, in which we selected, for both men and women, only the individulas in the urban areas belonging to occupations in non-manual classes (excluding proprietors and employers). Using this group of classes we repeated the wage inequality decomposition methodology. With these procedures we tried, for the first time, to identify possible contradictory trends hidden in our previous analyses. Once again, it was possible to identify that the proportion of income inequality explained by the *between classes* (BC) component have been decreasing since the beginning of the 1980's – with the exception of non-manual classes for women – to the point of becoming almost irrelevant to the manual classes. In fact, among the manual classes the *intra class between occupations* (IC/BO) component became more important than the *between class* (BC) component. However, in the non-manual classes the differences between classes are stil relevant, its trends stand around 25% (for women) and 35% (for men) in explaning inequality trends. Our results do not support the weak or the strong versions of the occupationalization hypotheses, since we did not identify a significant increase in the trends of the *between occupations* (IC/BO) component. What we cannot neglect is the increasing importance of intra-occupational inequaltiy, both among men and women. This trend is even more important among the non manual classes, with this component accounting for at least 60% of total income inequality in 2001.

Finally we implemented a third set of analyses, a still more detailed decomposition. That is, we examined the internal inequalities of a set of selected classes by distinguishing between two components: (1) *between occupations*, and (2) *intra-occupations* inequality. Following these procedures it was possible to identify the relations between each class and wage inequality. Contrary to our expectations derived from the weakest hypothesis about occupationalization, the *between occupations*

component for the more specialized classes is not relevant in comparision to its importance for the manual classes. Besides, there was a convergence between non-manual classes during the 1990's, the four classes evaluated had around 15% to 20% of their internal inequalites associated to differences between occupations. Although these values cannot be neglected, they are not sufficiently high to inequivocally support the weakest occupationalization hypothesis. If we move to a discussion of the strong occupationalization hypothesis, our evidences are not strong enoght to support it, as well. Altough it was possible to identify some occupationalization trends among specific classes, these seemed to have an episodic character, short term trends in which the increasing importance of the *between occupations* component was followed by stability. In addition, we also identified more consistent "de-occupationalization" processes at least for two classes – routine non-manual workers of high level (office) and technicians and supervisors of manual work.

These conclusions do not lead us to a full rejection of the approach proposed by Grusky and his followers (…) against the Brazilian case. On the contrary, we think that the mechanisms behind the trends we evaluated may be the same operating in the American context, mostly occupational closure. The difference is that in Brazil we do not identify the creation of barriers, but the reverse trend, that is, the process of diminishment in occupational closure. We intend, however, to expand the discussion of this issue in a revised version of this paper.

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ANNEX I – Class schemas

Costa Ribeiro (2007)	Erikson e Goldthorpe – EGP12
I – Administrative and Professionals, high level	I - Higher-grade Professionals & Adminastrators
II – Administrative and Professionals, low level	II - Lower-grade Prof & Adm
IIIa1 – Routine non-manual, high level (office)	IIIa - Higher-grade Routine non-manual
IIIa2 – Routine non-manual, high level (supervision)	
IIIb1 – Routine non-manual, low level (office)	IIIb – Lower-grade Routine non-manual
IIIb2 – Routine non-manual, low level (services)	
IVa – "Small" proprietors, with employees	Iva - "Small" proprietors, with employees
IVb – "Small" proprietors, without employees	Ivb - "Small" proprietors, without employees
IVc2 – Rural Self-employed	IVc2 - Rural Self-employed
IVc1 – Rural employers	IVc – Rural employers
V – Supervisors and technicians of manual work	V - Técnicos e supervisores do trabalho manual
VIa – Specialized workers in modern industries	VI - Skilled manual workers
VIb – Manual workers at traditional industries	
VIc – Specialized workers, Services	

VIIa1 – Non specialized industrial workers	VIIa - Semi- & unskilled manual workers
VIIa2 – Non specialized service workers	
VIIa3 – Semi & unskilled manual workers, Domestic services	
VIIa4 - Semi & unskilled manual workers, informal sector in general	
VIIb - Agricultural Workers	VIIb - Agricultural Workers

ANNEX II – Classes distribution, 1981-2007

Valid percentage, men and women, 1981-1993

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
I	3,8	3,7	3,7	3,8	3,7	3,8	3,9	4,1	4,2	4,0		3,8	4,1
II	4,5	4,4	4,5	4,7	4,6	5,0	5,4	5,5	5,5	5,3		5,6	5,5
IIIa1	3,9	3,9	4,2	4,3	4,5	4,4	4,3	4,6	4,6	4,7		7,5	7,4
IIIa2	3,2	3,1	3,1	3,1	3,2	3,4	3,3	3,5	3,6	3,4		3,9	3,9
IIIb1	4,0	4,0	4,0	4,2	4,4	4,5	4,5	4,6	5,0	4,9		5,7	5,5
IIIb2	1,1	1,0	1,1	1,2	1,1	1,1	1,1	1,2	1,3	1,2		1,3	1,3
IVa	3,3	3,5	3,5	3,5	3,4	3,8	3,8	3,8	4,7	5,1		3,6	3,5
IVb	3,7	3,9	3,9	3,8	4,0	4,1	4,4	4,4	4,3	4,8		5,4	5,5
IVc2	11,7	11,6	9,6	11,2	10,7	10,2	8,8	9,1	8,8	8,3		8,2	8,0
IVc1	1,5	1,6	1,3	1,5	1,4	1,3	1,2	1,0	1,2	1,5		1,3	1,2
V	2,5	2,6	2,5	2,5	2,5	2,5	2,7	2,9	2,5	2,4		2,3	2,3
VIa	4,5	4,4	4,3	4,3	4,5	4,5	4,5	4,5	4,6	4,2		4,3	4,2
VIb	10,5	10,6	9,8	9,6	9,6	10,2	10,1	9,7	9,7	9,6		10,2	10,3
VIc	2,4	2,5	2,7	2,6	2,7	2,9	2,9	3,0	3,0	3,0		3,3	3,4
VIIa1	8,8	8,1	11,0	7,7	8,1	7,7	8,4	8,0	7,7	7,4		6,1	6,5
VIIa2	6,1	6,0	6,0	5,9	5,9	5,9	5,9	6,0	6,0	6,1		10,6	10,8
VIIa3	10,5	11,2	11,5	11,6	11,7	11,6	12,1	12,0	12,0	12,0		4,0	3,7
VIIa4	2,6	2,5	2,6	2,9	2,7	2,9	2,7	2,6	2,9	3,1		3,3	3,4
VIIb	11,4	11,4	10,9	11,7	11,3	10,2	10,0	9,5	8,6	9,0		9,7	9,4
Total	101695	109841	111584	114096	119304	67274	71070	71724	68696	75385		73246	75368

Valid percentage, men and women, 1995-2007

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
I	4,2	4,4	4,3	4,5	4,4		4,7	4,1	4,2	4,0	4,2	4,2	4,2
II	5,2	5,6	5,2	5,2	5,3		5,4	4,9	4,6	4,6	4,9	5,0	5,1
IIIa1	7,2	7,0	7,0	7,0	7,2		7,5	6,5	7,0	7,0	7,1	7,4	7,3
IIIa2	4,0	4,0	4,0	4,3	4,2		4,0	3,8	3,7	3,6	3,5	3,4	3,6
IIIb1	6,1	6,7	6,8	6,8	7,0		7,6	6,1	6,4	6,4	6,7	7,2	7,3
IIIb2	1,3	1,3	1,3	1,4	1,2		1,4	2,1	2,0	2,1	2,2	2,2	2,4
IVa	3,5	3,3	3,5	3,4	3,4		3,4	4,2	3,9	3,8	4,0	4,3	3,6
IVb	5,5	6,0	5,9	5,5	5,6		5,5	5,0	5,1	4,9	4,9	4,7	4,6
IVc2	8,2	7,9	8,1	7,6	7,6		6,7	6,0	6,0	6,2	5,4	5,2	4,8
IVc1	1,1	0,9	0,9	0,9	0,9		0,8	0,6	0,7	0,7	0,6	0,6	0,5
V	2,1	2,2	2,3	2,1	2,1		2,1	3,1	2,6	2,7	3,3	2,8	3,1
VIa	4,5	4,2	4,2	4,1	4,1		4,2	5,4	5,6	5,7	5,7	5,7	5,9
VIb	10,2	10,7	10,3	10,4	10,2		10,2	8,0	8,0	7,8	7,3	7,7	7,7
VIc	3,7	3,4	3,7	3,9	3,8		4,1	4,4	4,6	4,4	4,5	4,6	4,7
VIIa1	6,2	6,2	6,3	6,4	6,8		6,7	6,5	6,2	6,3	6,4	6,3	6,5
VIIa2	10,7	10,5	10,7	11,4	11,1		11,3	9,5	9,6	9,8	9,5	9,7	9,8
VIIa3	3,8	3,4	3,3	3,4	3,2		3,2	10,5	10,5	10,7	10,8	10,7	10,6
VIIa4	4,0	3,4	3,5	3,6	3,7		3,7	3,0	3,0	2,8	2,9	2,7	2,6
VIIb	8,6	8,8	8,7	8,1	8,2		7,5	6,2	6,3	6,4	6,1	5,7	5,7
Total	80924	78087	83296	83615	85048		93254	114054	114789	122373	125684	129415	127535