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Deprivation in the São Paulo Districts: Evidence from 2000*

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Abstract

This paper aims at capturing the level of deprivation of São Paulo's population in 2000 as suffered by its inhabitants in a non-income framework. We construct a measure of functioning failure which indicates the degree to which functionings that are considered relevant in the city districts are not available to the individuals. Deprivation is measured by various indices proposed in the literature: 1) the Yitzhaki, 2) the Esteban and Ray, and 3) the Bossert, D'Ambrosio and Peragine indices. *Journal of Economic Literature* Classification No.: D63.

Keywords: Deprivation, Functionings, Poverty.

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1 Introduction

Brazil is often described as the land of inequalities and deprivation is an important issue in its metropolitan areas. The city of São Paulo, its richest city in terms of GDP, shows striking disparities among its inhabitants (10.4 million in 2000) and worrisome indicators of economic well-being. Income inequality is extremely pronounced: while the poorest 20% possess only 1.5% of total income, the value of the richest 10% is 49%, with a Gini coefficient (computed on household per capita income) of 0.62. Beyond income inequality, there are more than 2 million living in slums (adding favelas and clandestine lots, see Torres, 2003b), almost 9,000 homeless, an unemployment rate higher than 16% since 2000 (accounting more than 1 million of unemployed in 2003, Seade, 2005b), a general mortality rate of 7.04 (rate for 1,000 inhabitants), infant mortality of 16.29 (rate for 1,000 born alive) per year (See Pardini, 2003) Although more than 90% of children frequent primary education, just 54% of teenagers of the city have access to high school, besides 4.5 % of the adult population is illiterate (Seade, 2005b). Conflict in the city, taking homicide rate as indicator, is also extremely high on average, diverging heavily across or even within districts: the city homicide rate in 2000 was 57 for 100 thousand inhabitants, with this value varying from 4 up to 104 depending on the district (with a standard deviation of 24). Although homicide rates are higher in poor districts, in rich and middle class neighborhoods homicides are usually extremely high in the favelas placed there (see Drumond, 1999). Lethal violence in the city constitutes a serious problem especially for the poorest segments of the population, owing to a strong spatial correlation between homicide rates and favelas concentration (see Rodrigues, 2005).

All these facts make of São Paulo a unique case study for deprivation: how does someone living in such a city relates to others? The definition of deprivation adopted in this paper is that offered by Runciman (1966, p.10): "We can roughly say that [a person] is relatively deprived of X when (i) he does not have X; (ii) he sees some other person or persons, which may include himself at some previous or expected time, as having X, (iii) he sees it as feasible that he should have X". He further adds: "The magnitude of a relative deprivation is the extent of the difference between the desired situation and that of the person desiring it". One of the key variables in measuring deprivation is the reference group, that is the group with which a person compares itself. We assume that in São Paulo the comparison takes place at the district level: individuals feel that they belong to the district where they live and derive within it their standards of comparison (See Section 3 for a detailed description). This paper aims at capturing the level of

plight of São Paulo's population in 2000 analyzing the level of deprivation suffered by its inhabitants.

The measurement of deprivation in a society has traditionally been conducted analyzing incomes of individuals, as income summarizes command over resources and is an index of the individual's ability to consume commodities. In this framework a seminal paper is that by Yitzhaki (1979) where it is suggested that an appropriate index of aggregate deprivation is the absolute Gini index. Hey and Lambert (1980) provide an alternative motivation of Yitzhaki's result. Duclos (2000) shows that a generalization of Gini, the class of S-Ginis, could be interpreted as indices of relative deprivation.

A reason for being interested in deprivation is its representation of the degree of discontent or injustice felt by the members of a society. In view of this fact, Podder (1996) criticizes the measure of deprivation proposed in the literature and discusses the reasons why these are unable to capture the phenomenon. Deprivation and inequality are different concepts, hence an index of inequality, such as the Gini coefficient, is inappropriate to measure deprivation. In Podder (1996) the distinction between the two is explained by their relations to envy. "We say that a person i has a feeling of envy towards person j if he prefers to exchange his consumption bundle with that of person j" Podder (1996, p.356). Deprivation is proportional to the feeling of envy towards the better off. Equity–the absence of inequality–is the absence of envy in all economic agents. At the same time, equity coincides with minimum deprivation–all individuals possess the same level of income. In constrast, the upper bounds of deprivation and inequality do not coincide. Maximum inequality is reached when one individual monopolizes the entire total income; maximum deprivation for Podder, on the other hand, is obtained when the society is polarized in two equal-sized groups, those possessing income and those not possessing it.

An analogous distinction with inequality is at the basis of the concept of polarization of Esteban and Ray (1994). In a companion paper, Esteban and Ray (1999) link social tension and conflict to polarization. The proposed measure of polarization is a variation of the Gini coefficient, where not only alienation pays a role, that is the symmetric gaps of income that are at the heart of the Gini index, but also identification with identical individuals, which is inexistent in the Gini coefficient. Following the Esteban and Ray identification/alienation framework, Bossert, D'Ambrosio and Peragine (2005) proposed an alternative index of deprivation. (See Section 2 for a detailed description of these indices).

In this paper we compare deprivation in the districts of São Paulo in 2000 using the absolute Gini coefficient, the polarization index of Esteban and Ray (1994) and the de-

privation measure of Bossert, D'Ambrosio and Peragine (2005). Since we believe that income is not always a good indicator of the command over resources nor of well-being of an individual, we follow the suggestion of Bossert, D'Ambrosio and Peragine (2005) and compute the indices on deprivation scores based on various functionings. Our exercise presents two interesting results. Firstly, the deprivation rankings of districts (by all indices) differ from what has been previously reported on São Paulo: we observe a decrease in the deprivation position of very poor and homogeneous districts and an increase in that of some middle class and rich neighborhoods. This is partially due to the inclusion of variables not investigated before, but mainly it is the effect of our choice of indices and reference group. Secondly, the rankings of the deprivation index of Bossert, D'Ambrosio and Peragine and of that of Esteban and Ray differs from inequality/deprivation ranking measured by the absolute Gini coefficient. Even though there is not a clear tendency for the divergence, in several cases, if the district is very unequal and fractionalized, Bossert D'Ambrosio and Peragine and the Esteban and Ray measure, the latter more intensely so, place the district in a lower deprivation position compared to the Gini; the inverse occurs if the district is not so unequal but highly polarized. Responsible for these changes in the rankings is the identification component, which is absent in the Gini coefficient.

The remainder of the paper is organized as follows. The measures of deprivation applied in the paper are presented in Section 2. In Section 3, we describe the empirical results for Census data for the year 2000. Section 4 concludes.

2 Measuring deprivation

In this section we introduce the indices applied to measure deprivation in the São Paulo districts. We start with the measure proposed by Bossert, D'Ambrosio and Peragine (henceforth BDP, 2005). $\mathbb{N}$ denotes the set of all positive integers and $\mathbb{R}$ ($\mathbb{R}_+$, $\mathbb{R}_{++}$) is the set of all (all non-negative, all positive) real numbers.

BDP assume that, for each individual, there exists a measure of functioning failure which indicates the degree to which functionings that are considered relevant in the society under analysis are not available to the agent. The individual functioning failures constitute the primary inputs for the analysis and have been predetermined in an earlier stage. A natural possibility for such a measure is the number of functioning failures, which is the measure used in our empirical application.

The distinct levels of functioning failures are collected in a vector $(q_1,...,q_K)$ where $K \leq \mathbb{N}$. Let π_j indicate the population share composed of individuals suffering the same

level of functioning failures, q_j. A distribution is $(\pi, q) \equiv (\pi_1, ..., \pi_K; q_1, ..., q_K)$, $q_i \neq q_j$ for all $i, j \in \{1, ..., K\}$. Let Ω be the space of all distributions. $\overline{q}$ indicates the illfare ranked permutation of the vector q, that is $\overline{q}_1 \leq \overline{q}_2 \leq ... \leq \overline{q}_K$.

The members of the class of deprivation measures, $D_i \colon \Omega \to \mathbb{R}_+$, characterized by BDP are such that the degree of deprivation for a distribution (π, q) is obtained as the product of two terms with the following interpretation. The first factor is a multiple of the ratio of the number of agents who have fewer functioning failures than i and the population size. This number is interpreted as an inverse indicator of agent i's capacity to identify with other members of society–the lack of identification. The second factor is the average of the differences between q_i and the functioning failures of all agents having fewer functionings failure than i. This part captures the aggregate alienation experienced by i with respect to those who are better off. In particular the index is defined by:

$$D_i(\pi, q) = \left(\sum_{j=1}^{i-1} \pi_j \right) \sum_{j=1}^{i-1} (\overline{q}_i - \overline{q}_j) \pi_j,$$

for all $(\pi, q) \in \Omega$.

This index of individual deprivation incorporates elements of indices proposed earlier in the literature of deprivation and polarization. Re-written in terms of functioning failures, the individual deprivation suggested by Yitzhaki (1979), a function $I_i \colon \Omega \to \mathbb{R}_+$, is given by:

$$I_i(\pi, q) = \sum_{j=1}^{i-1} (\overline{q}_i - \overline{q}_j) \pi_j,$$

for all $(\pi, q) \in \Omega$, while the effective antagonism introduced by Esteban and Ray (henceforth ER, 1994), a function $A_i \colon \Omega \to \mathbb{R}_+$, is defined as:

$$A_i(\pi, q) = (\pi_i)^{\beta} \sum_{j=1}^{K} |q_i - q_j| \, \pi_j,$$

for all $(\pi, q) \in \Omega$, where $\beta \in [1, 1.6]$ indicates the degree of polarization sensitivity. In this paper we chose $\beta = 1$; we will assume this parameter value in what follows.

The three measures share similar elements. Yitzhaki's measure focuses uniquely on the second factor of BDP. Thus, taking into consideration the lack of identification in addition to aggregate alienation is what distinguishes the BDP approach from earlier contributions. The BDP index resembles that suggested by Esteban and Ray to some extent. However, it distinguishes itself from the latter in that it is a measure of deprivation where an asymmetry in the alienation component is called for–an individual experiences alienation

only with respect to those who are better off. Moreover, a more comprehensive concept of identification is required because an individual identifies not only with those like it but, instead, with all individuals who are equally well or worse off.

The BDP aggregate measure of deprivation is a function $\mathbf{D}\colon \Omega \to \mathbb{R}_+$ such that:

$$\mathbf{D}(\pi, q) = \sum_{i=1}^{K} \pi_i \left(\sum_{k=1}^{i-1} \pi_k \right) \sum_{j=1}^{i-1} (\overline{q}_i - \overline{q}_j)\pi_j, \tag{1}$$

for all $(\pi, q) \in \Omega$.

Similarly, aggregate deprivation suggested by Yitzhaki (1979), $\mathbf{I}\colon \Omega \to \mathbb{R}_+$, is given by:

$$\mathbf{I}(\pi, q) = \sum_{i=1}^{K} \pi_i \sum_{j=1}^{i-1} (\overline{q}_i - \overline{q}_j)\pi_j, \tag{2}$$

for all $(\pi, q) \in \Omega$, which is equal to the product of the mean of the vector q and the Gini coefficient, resulting is the absolute Gini coefficient. In the same way, the effective antagonisms felt by all members of the society is total polarization proposed by Esteban and Ray (1994), $\mathbf{P}\colon \Omega \to \mathbb{R}_+$, is defined by:

$$\mathbf{P}(\pi, q) = \sum_{i=1}^{K} \sum_{j=1}^{K} (\pi_i)^2 \, |q_i - q_j| \, \pi_j, \tag{3}$$

for all $(\pi, q) \in \Omega$.

Clearly, the minimal aggregate level of deprivation is equal to zero and attained in the case where everyone has the same level of functioning failure, that is, in the case of complete equality. This is true for Yitzhaki's (1979) deprivation index and for BDP and ER. In contrast, the maximal level of Yitzhaki's deprivation index is attained for a distribution where one individual has access to all functionings and everyone else has the maximal possible functioning failure. Furthermore, ER measure of polarization is maximal for a distribution where half of the population have full functioning failure whereas the other half have no functioning failures. Interestingly, the BDP aggregate measure of deprivation is not maximal for either of those distributions.

3 The results

We are not the first to study economic well-being in the districts of São Paulo (see Sposati, 2000, for an analysis of social exclusion and Seade, 2005a, for vulnerability, just to mention

a few). The present exercise differs in several aspects from previous work: 1) the indices–we measure deprivation with Yitzhaki's index, the ER polarization index, the BDP index; 2) the reference groups–we assume that the comparison takes place mainly at the district level; 3) the functionings analyzed (see below for a discussion). We decide to focus on four domains of well-being of an individual, namely: **i**) living in a secure place with access to urban services; **ii**) attaining the average educational level of its age group; **iii**) having access to a job of minimum quality; **iv**) having access to the minimum standard of consumption of the city. The indices are computed separately for domain **i**) and for all the domains simultaneously.

We use the following variables from the microdata of the Censo 2000 in order to compute individual levels of functionings failures, the q_j's and the associated population shares π_j's of the expressions in the previous section (see Table 1 in the Appendix for a detailed description of the variables used).

In particular in domain **i**) we consider deprived an individual with the following characteristics: 1. Lives in a rural area. 2. Lives in a favela. 3. Its dwelling is "improvised". 4. Its dwelling is of the one-room type. 5. Its dwelling is overcrowded. 6. Lives in a polluted area. 7. Lives in a place not served by good urban services. For domains **ii**) we consider deprived the following individuals : 8. Does not have (or has not had) access to formal education; for domain **iii**): 9. Unemployed. or 10. Is a domestic paid worker. Finally, for domain **iv**) deprived is someone who: 11. Does not have access to a minimum standard of consumption.

The individual functioning failure employed in the application is the number, unweighted, of the above listed variables that the interviewed claimed to have, or not to have, depending on the variable. As a clarifying example for the way we obtain functioning failures, consider the variables in the first domain. An individual living in a rural area is assigned a score of 1; if, in addition, it lives in a favela it obtains a score of 2; if, furthermore, the dwelling is "improvised" then it receives the score 3. And so on for all the variables. Once we have obtained these scores for all individuals, we compute the population shares associated to the scores for each district separately. In the final step we proceede with the calculation of the indices. Keeping the analysis separate at the district's level is driven by our assumption that the comparison takes place at this level: individuals feel that they belong to the district where they live and derive within it their standards of comparison, as previously explained. Some variables, though, are related to the entire city (education of domain **ii**), labour force status and kind of job of domain **iii**) consumption's standards of domain **iv**)).

The first, domain **i**), seeks to capture the deprivation felt by people living in favelas and other kinds of segregated areas characterized by heavy deprivations in terms of housing conditions, access to urban services, high level of violence and the social stigma associated with it (see Cardia, 2003, Caldeira, 2000). These variables are related to the place of residence beyond the conditions of the house in itself. In that, they aim at capturing social and environmental aspects of well being such as, for instance, the condition of "illegality" and the situation of risk of suffering natural accidents for individuals living in favelas (characterized by being an illegal occupation) or clandestine lots (which are frequently placed on environmentally protected areas, such as the water source reservoirs of Billings and Guarapiranda, Serra da Cantareira forest reserve), where the buildings, besides being mostly illegal/irregular, are in addition built in bad terrains (see PMSP, 2002, Sampaio, 1998, Fernandes, 2003, Torres 2005). Because there are no direct variables in the Censo to identify favelas and other kinds of segregated areas, we use the variables in *Instituto Brasileiro de Geografia e Estatística* (IBGE) data that best approximate them (see notes on Figure 1 in the Appendix). The relevance given worldwide to this Brazilian phenomenon persuaded us to analyze deprivation for this domain separately, as a first step of our analysis.

Domain **ii**) captures deprivation felt by any person who does not attain the average education level within the city for its age group and, in that, it reflects the lower access to at least a high school education of people in São Paulo's periphery (see Seade, 2005b). Domain **iii**) focuses on the deprivation felt by any adult who cannot get a job, or by the entire family when the head of the household is unemployed, as well as the low quality of jobs offered typically to poor women. For the latter, we focus on domestic workers: this group represents around 15% of women's occupation rate within the city, with values that rise to 35% in favelas. At the same time the term "domestic worker" has a symbolical meaning: it represents an occupation of the "bottom floor" (see Melo, 1998). The last domain **iv**) is the usual classification of population between poor and non-poor, using a poverty line relative to the city income distribution.

We present the results of our analysis in two steps. First, we discuss the deprivation indices applied to the functionings of domain **i**). Second, we present the overall indices and comment on the effect of the inclusion of the remaining variables. To better separate the effects captured by the deprivation indices in terms of alienation/identification–that is, the interactions between the differences in the functioning failures and the population shares–we compare the indices with the sample means of the functioning failures. The sample mean, as such, is a purely statistical indicator of the level of deprivation; the

other indices, on the other hand, are derived from behavioral models in the sense that they try to capture perceptions of individuals when comparing themselves to others. The clearest example to better explain this last point is the following: when the majority of the individuals are highly deprived we would observe a high value of the sample mean but not of the indices. This is indeed what we observe in our data.

*Insert Figure 1: Favelas, Rurais and Sample Mean of Variables in Domain **i**).

Figure 1 shows how domain **i**) reflects precariousness of "place of residence", by comparing the localization of favelas ("subnormal sectors", in IBGE) and areas of environmental protection ("rural areas" in IBGE)–at the left side of the figure–with five collections of districts grouped according to their sample means of variables in domain **i**)–at the right side of the same figure. In São Paulo precariousness is not exclusively a peripheral phenomenon: some districts in the city center that are well served by urban services and have no favelas show means relatively high, owing to their proportions of other kinds of precarious housing units (like "one-room type" or "improvised" houses, see note on Table 1 in the Appendix).

* Insert Figures 2 and 3

In Figure 2 we plot the rankings obtained from the sample mean against the rankings resulting for the deprivation indices, the values being contained in Table 2 in the Appendix. 1 indicates the lowest value of the index, 96 the highest (since there are 96 districts in total). If the indices would produce the same rankings of the sample mean, we would observe values lying on the 45^o line since we have ordered the districts according to its rankings. This is what we observe for a third of our sample, the least deprived districts. From the district occupying the 35^{th} position onwards, on the other hand, we observe increasing dissimilarities, with the three indices showing similar patters with values being on average higher first and lower afterwards. According to behavioral deprivation indices, the most deprived districts based on the means of the functionings score would be less deprived than those occupying the middle positions. The three behavioral indices applied to the functionings of domain **i**) tend to reduce the importance of deprivation in districts with very high sample mean and very low population share having full access, that is the individuals showing $q_j = 0$. In the extreme south of the city, Marsilac (52), which is the worst in the ranking according to the sample mean, jumps to the middle of the orders of ER and down to the 35^{th} position according to BDP; similarly, Parelheiros (55) and Cidade Tiradentes (25) fall considerably in position; in these districts the population share

with $q_j = 0$ is zero (in Marsilac) or, almost zero (in Parelheiros and Cidade Tiradentes), because they are (totally or almost) rural districts. In Figure 3, we plot the rankings of the three deprivation indices relative to the Yitzhaki index. As the figure shows, the rankings do not coincide. We confirm values being on average higher first and lower afterwards for BDP and ER, modifying Yitzhaki's rankings. BDP and ER register higher values in districts that are extremely polarized (high proportions of population with $q_j = 0$ and $q_j > 0$) and lower values in districts that are homogeneously deprived (very low population share with $q_j = 0$). Indeed, on the top of the BDP and ER rankings stand districts such as Jaguaré (41), where favelas account for around 30% of households while being a middle class district. In districts such as Jaguaré, the majority of the population shows the lowest q_j's ($q_j = 0$) but the highest q_j's (in this case $q_j \geq 4$) account for big proportions of the population. In contrast, Parelheiros (55) goes back to the 62^{nd} position in ER, while being among the most deprived according to BDP and Yitzhaki–81^{st} and 89^{th} position respectively.

* Insert Figure 4

Figure 4 gives a spacial view of the differences described above. The districts of the city center, where the majority of individuals have complete access, presents the lowest values according to all measures, for the others it depends on the index used and on the importance given to the alienation component–the heart of the Yitzhaki index–to its interaction with identification–in the ER index–to the modification of the latter–in the BDP index.

* Insert Figures 5, 6 and 7

When we add the other domains, **ii**) to **iv**), the overall picture of the results for the three indices keep showing the overall tendencies previously commented on for the case of domain **i**) but the differences are now amplified. In Figure 5, the equivalent of Figure 2, we plot the rankings obtained from the sample mean against the rankings resulting for the deprivation indices, the values being contained in Table 3 in the Appendix. The rankings now coincide only for very few districts, precisely 17. From that point onwards we observe increasing dissimilarities, with the three indices showing similar patters with values being on average higher first and lower afterwards, as in the case of domain **i**), but with all the variables jointly considered, the waves are wider. In addition, the indices better discriminate the deprivation level of richer districts, particularly so BDP and ER. This is partially an effect of the inclusion of "domestic paid workers" as a variable of

deprivation: the richest districts have high proportions of domestic workers, even if part of these women live in the house of their employers. The inclusion of the remaining variables has the further effect of giving higher scores to individuals already deprived in domain **i**), since to them opportunities of education, job and income tend to be worst. Overall BDP and ER reinforce the discrimination of the most polarized and the most homogeneous districts (Figure 6 and 7, and Table 3). The comparison of BDP and Yitzhaki orders shows that some poor districts in the extreme periphery (mostly in the South and the East) are more unequal than deprived due to their homogeneity, as in the cases of Marsilac, Parelheiros, Lajeado, Guaianazes and Cidade Tiradentes, which fall considerably in the rankings, from Yitzhaki to BDP. On the other hand, some rich and middle class districts (mostly in the West zone) are more deprived than unequal due to polarization, as Morumbi, Barra Funda, Campo Belo, Vila Sônia and Rio Pequeno, which rise considerably in ranking's position from Yitzhaki to BDP. In the ranking generated by ER districts in the extreme periphery are not on top (except for Tremembé, which is partially occupied by rich people), but in the middle or even in the lower end of the ranking. This is due to the homogeneous deprivation present in these districts. In contrast the rich and middle-class districts of the West zone cited above are, together with less peripheral districts (including some with very big favelas, as Heliópolis in Sacomã) at the top, being the most polarized districts in the city. See Figure 6 for the rankings of the three deprivation indices relative to the one generated by Yitzhaki's. See Figure 7 for a spacial view of the differences described above.

Figure 8 below is an example of polarized and homogeneous districts. The left panel represents rich and middle class districts in the Western zone, which have big proportions of households in favelas (48% in Vila Andrade, 11% in Morumbi, 27% in Jaguaré, and 17% in Vila Sônia, 17% in Rio Pequeno). Favelas are represented by ligheter-colored parts of the districts, including Paraisópolis, in Vila Andrade, one of the most populated in the city. While people from favelas show high scores on deprivation, people outside favelas are not deprived at all (or much less deprived)–polarization is high. The panel on the right represents districts in the extreme Eastern zone, where there are few households in favelas (4% in Lajeado) but where a lot of individuals show high functioning failure (for instance, besides income, there are big proportions in "rural" areas, 87% in Cidade Tiradentes and 16% in Guaianazes)–these are "homogeneous districts".

* insert Figure 8

4 Conclusion

This paper investigates deprivation as measured by behavioral indices such as the Yitzhaki and the Bossert, D'Ambrosio and Peragine deprivation indices and the polarization index of Esteban and Ray. As opposed to statistical measures such as sample means, these indices allow to capture perceptions of individuals when comparing themselves to others. Thus they better identify deprivation of poor individuals living in rich districts, and of poor individuals living in poor districts characterized by a homogeneous status of deprivation. Polarization and deprivation are important aspects of the Brazilian society, particularly so for cities like São Paulo where there is a considerable proportion of people "having" but the majority are "have-nots".

In this paper we have assumed that the comparison among individuals takes place at the district level. Future work will aim at extending the analysis assuming various reference groups, such as the entire city, age, education groups.

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Tables:

Table 1: Domains of Deprivation and Related Variables.

Domain	Variables	x (derived variable)	deprivation condition	age	deprivation score (q)
i.	1. Does the person live in a rural area?	Directly from Census questionarie			1 if yes and 0 if no
	2. Does the person live in a favela?	idem			1 if yes and 0 if no
	3. Is the person dwelling "improvised"?	idem			1 if yes and 0 if no
	4. Is the person dwelling of the one-room type?	idem			1 if yes and 0 if no
	5. Is the person dwelling overcrowded?	total inhab/bedroom	3		1 if x>3 or the dwelling is improvised and 0 if x<=3
	6. Does the person live in a polluted area?	Is the sewerage of dwelling collected?			0 if yes and 1 if no or the dwelling is improvised
	7. Does the person live in a place served by good urban services ?	Is the street of the dwelling totally pavimented?			0 if yes and 1 if no
ii.					
	8. Does the person have (or has had) access to formal education?	How many years of study the person has?	city mean of years of study for each age group	age>=8	0 if x>=z and 1 if x<z
		Does the person frequent school or kindgarden ?		4>=age<=7	0 if yes and 1 if no
				age<=3	0
iii.	9. Is the person unemployed ?	Directly from Census questionarie		age>=18	1 if yes and 0 if no or non active
		Is the head of household unemployed?		age<18	1 if yes and 0 if no
	10. Is the person a domestic paid worker?	Is the person a domestic paid worker?		age>=18	1 if yes and 0 if no or non active or unemployed
		Is the head of household a domestic paid worker?		age<18	1 if yes and 0 if no
iv.	11. Has the person access to a minimun standard of consumption?	household per capita income	2nd decile of the city household per capita income (137 reais)	0 if x >=z and 1 if x <z	1 if yes and 0 if no

1. Rural areas are mostly regulated by environmental laws which restrict human occupation, but there are many clandestine lots occupied by poor people in those areas. See PMSP (2002) and Torres (2005) to verify the coincidence of environmental protected areas, rural sectors and clandestine settlements.
2. IBGE classifies favelas as "subnormal sectors". See Torres (2003b) for a description of IBGE method for accessing favelas and the differences of favelas and clandestine lotted places.
3. IBGE considers improvised dwellings the situation of people living in the streets, or ships, or provisional lodgings for workers (like the ones to building workers).
4. IBGE classifies as "one-room type" depleted dwellings, lacking privated bathroom and kitchen, excluding pensions, hotels and other kinds of "collective" inhabitations.

Table 2: Deprivation Indices for Domain i)

district		mean(q)		Absolute-Gini		BDP		Polarization	
number	name	order		order	index	order	index	order	index
32	Moema	1	0.019	1	0.019	1	0.019	1	0.019
62	Pinheiros	2	0.027	2	0.026	2	0.026	2	0.026
45	Jardim Paulista	3	0.034	3	0.033	3	0.032	3	0.032
60	Perdizes	4	0.04	4	0.039	4	0.038	4	0.039
90	Vila Mariana	5	0.041	5	0.04	5	0.04	5	0.04
35	Itaim Bibi	6	0.054	6	0.053	6	0.051	6	0.051
71	Santo Amaro	7	0.057	7	0.055	7	0.053	7	0.054
48	Lapa	8	0.065	8	0.062	8	0.06	8	0.061
26	Consolação	9	0.067	9	0.064	10	0.061	9	0.062
12	Butantã	10	0.069	10	0.064	9	0.061	10	0.064
77	Saúde	11	0.075	11	0.072	11	0.069	11	0.069
69	Santa Cecília	12	0.086	12	0.08	12	0.074	12	0.078
53	Mooca	13	0.088	13	0.083	13	0.078	13	0.08
2	Alto de Pinheiros	14	0.089	14	0.086	14	0.083	14	0.082
70	Santana	15	0.097	15	0.091	16	0.086	16	0.088
80	Tatuapé	16	0.097	17	0.092	17	0.089	15	0.087
14	Cambuci	17	0.1	16	0.092	15	0.085	17	0.089
1	Água Rasa	18	0.121	18	0.109	18	0.099	18	0.105
7	Bela Vista	19	0.137	19	0.122	19	0.109	19	0.117
82	Tucuruvi	20	0.141	20	0.126	20	0.113	20	0.12
51	Mandaqui	21	0.149	21	0.133	22	0.121	21	0.125
49	Liberdade	22	0.154	22	0.137	23	0.124	22	0.128
56	Pari	23	0.16	24	0.142	24	0.127	23	0.134
21	Casa Verde	24	0.164	23	0.139	21	0.119	24	0.136
16	Campo Grande	25	0.173	27	0.155	29	0.142	25	0.141
20	Carrão	26	0.175	28	0.156	28	0.141	27	0.143
86	Vila Guilherme	27	0.175	25	0.15	26	0.131	26	0.142
91	Vila Matilde	28	0.18	26	0.153	25	0.131	28	0.147
85	Vila Formosa	29	0.186	29	0.159	27	0.139	29	0.149
27	Cursino	30	0.196	30	0.168	30	0.147	30	0.154
79	Socorro	31	0.199	31	0.172	31	0.154	31	0.156
59	Penha	32	0.218	33	0.189	33	0.168	32	0.169
29	Freguesia do Ó	33	0.224	32	0.184	32	0.156	33	0.17
66	República	34	0.231	34	0.198	34	0.173	34	0.177
8	Belém	35	0.25	37	0.224	40	0.207	37	0.193

district		mean(q)		Absolute-Gini		BDP		Polarization	
number	name	order		order	index	order	index	order	index
40	Jaguara	36	0.263	35	0.217	37	0.185	35	0.192
72	São Lucas	37	0.264	36	0.222	38	0.194	36	0.193
15	Campo Belo	38	0.273	42	0.25	46	0.236	45	0.221
93	Vila Prudente	39	0.284	40	0.243	42	0.218	38	0.205
88	Vila Leopoldina	40	0.285	43	0.256	47	0.238	44	0.22
64	Ponte Rasa	41	0.301	41	0.244	41	0.208	39	0.208
92	Vila Medeiros	42	0.304	39	0.243	39	0.203	40	0.209
10	Brás	43	0.305	44	0.259	43	0.23	42	0.216
4	Aricanduva	44	0.306	45	0.261	44	0.232	43	0.218
78	Sé	45	0.314	38	0.234	36	0.181	41	0.212
5	Artur Alvim	46	0.324	46	0.276	49	0.246	46	0.226
9	Bom Retiro	47	0.326	47	0.279	50	0.25	47	0.229
50	Limão	48	0.354	49	0.284	48	0.242	49	0.232
34	Ipiranga	49	0.361	51	0.306	52	0.274	51	0.246
18	Cangaiba	50	0.362	48	0.281	45	0.233	48	0.23
63	Pirituba	51	0.363	50	0.296	51	0.257	50	0.237
54	Morumbi	52	0.371	53	0.318	56	0.286	57	0.268
6	Barra Funda	53	0.393	55	0.33	57	0.29	68	0.285
47	José Bonifácio	54	0.411	54	0.328	54	0.282	53	0.255
38	Jabaquara	55	0.448	58	0.362	63	0.315	60	0.273
74	São Miguel	56	0.449	57	0.342	55	0.284	55	0.26
65	Raposo Tavares	57	0.467	56	0.341	53	0.275	54	0.26
95	São Domingos	58	0.496	59	0.371	60	0.305	61	0.276
24	Cidade Lider	59	0.513	60	0.372	58	0.299	58	0.272
37	Itaquera	60	0.52	61	0.375	59	0.302	59	0.273
73	São Mateus	61	0.526	62	0.39	66	0.322	64	0.28
89	Vila Maria	62	0.539	69	0.43	73	0.373	78	0.308
68	Sacomã	63	0.541	63	0.394	65	0.321	65	0.281
28	Ermelino Matarazzo	64	0.567	65	0.398	64	0.315	63	0.28
76	Sapopemba	65	0.586	67	0.422	69	0.344	71	0.291
94	Vila Sônia	66	0.587	71	0.457	76	0.39	89	0.332
84	Vila Curuçá	67	0.607	68	0.426	68	0.342	70	0.29
31	Guaianases	68	0.653	66	0.416	62	0.313	66	0.281
46	Jardim São Luís	69	0.66	73	0.459	72	0.368	74	0.301
36	Itaim Paulista	70	0.661	70	0.449	71	0.353	73	0.295
39	Jaçanã	71	0.665	76	0.485	78	0.401	83	0.315
67	Rio Pequeno	72	0.683	79	0.509	82	0.426	91	0.336
17	Campo Limpo	73	0.684	77	0.49	79	0.401	84	0.316

district		mean(q)		Absolute-Gini		BDP		Polarization	
number	name	order		order	index	order	index	order	index
23	Cidade Dutra	74	0.688	75	0.482	75	0.389	80	0.312
22	Cidade Ademar	75	0.744	80	0.509	80	0.407	85	0.316
13	Cachoeirinha	76	0.763	82	0.546	88	0.45	90	0.336
11	Brasilândia	77	0.768	78	0.492	74	0.379	75	0.301
19	Capão Redondo	78	0.774	81	0.511	77	0.4	81	0.313
96	Lajeado	79	0.79	74	0.472	70	0.349	69	0.289
42	Jaraguá	80	0.792	72	0.458	67	0.333	67	0.283
57	Parque do Carmo	81	0.809	83	0.551	85	0.444	88	0.326
87	Vila Jacuí	82	0.873	84	0.586	90	0.468	92	0.338
41	Jaguaré	83	1,006	92	0.706	96	0.566	96	0.463
44	Jardim Helena	84	1,026	86	0.595	86	0.447	79	0.31
61	Perus	85	1,029	87	0.614	89	0.465	86	0.325
43	Jardim Ângela	86	1,046	85	0.592	83	0.441	76	0.304
81	Tremembé	87	1,151	93	0.716	94	0.56	93	0.354
30	Grajaú	88	1,169	88	0.62	87	0.448	77	0.306
58	Pedreira	89	1,189	91	0.669	91	0.497	87	0.325
75	São Rafael	90	1,231	94	0.728	93	0.551	94	0.358
83	Vila Andrade	91	1,378	95	0.741	92	0.53	95	0.362
25	Cidade Tiradentes	92	1,424	64	0.397	61	0.312	56	0.264
3	Anhanguera	93	1,458	96	0.751	95	0.561	82	0.313
33	Iguatemi	94	1,581	90	0.668	84	0.443	72	0.294
55	Parelheiros	95	1,772	89	0.646	81	0.419	62	0.277
52	Marsilac	96	2,428	52	0.31	35	0.179	52	0.251

Source: Authors' calculations from IBGE-CENSO 2000.

Table 3: Deprivation Indices for all Domains.

district		mean(q)		Absolute-Gini		BDP		Polarization	
number	name	order		order	index	order	index	order	index
32	Moema	1	0.235	1	0.198	1	0.174	1	0.176
45	Jardim Paulista	2	0.262	2	0.222	2	0.196	2	0.192
90	Vila Mariana	3	0.27	3	0.226	3	0.197	3	0.195
60	Perdizes	4	0.302	4	0.243	4	0.206	4	0.207
62	Pinheiros	5	0.315	5	0.252	5	0.213	5	0.213
35	Itaim Bibi	6	0.336	6	0.272	6	0.233	6	0.223
71	Santo Amaro	7	0.361	7	0.281	7	0.234	7	0.23
26	Consolação	8	0.373	8	0.292	8	0.245	8	0.237
2	Alto de Pinheiros	9	0.39	10	0.314	11	0.27	10	0.247
77	Saúde	10	0.399	9	0.306	9	0.253	9	0.243
48	Lapa	11	0.446	11	0.323	10	0.256	11	0.253
12	Butantã	12	0.451	12	0.337	12	0.275	12	0.258
70	Santana	13	0.464	14	0.344	14	0.279	14	0.262
69	Santa Cecília	14	0.467	13	0.344	13	0.278	13	0.261
80	Tatuapé	15	0.479	15	0.351	15	0.283	15	0.265
53	Mooca	16	0.516	16	0.366	17	0.29	16	0.27
7	Bela Vista	17	0.537	18	0.39	19	0.317	23	0.28
49	Liberdade	18	0.55	19	0.403	21	0.329	30	0.284
14	Cambuci	19	0.567	17	0.375	16	0.284	17	0.271
15	Campo Belo	20	0.636	33	0.516	44	0.457	90	0.352
16	Campo Grande	21	0.639	23	0.449	30	0.361	56	0.298
82	Tucuruvi	22	0.66	21	0.425	20	0.322	29	0.284
1	Água Rasa	23	0.666	20	0.412	18	0.304	20	0.278
51	Mandaqui	24	0.692	22	0.448	25	0.344	41	0.29
79	Socorro	25	0.74	26	0.463	27	0.35	43	0.291
66	República	26	0.747	30	0.476	31	0.365	53	0.296
20	Carrão	27	0.749	24	0.457	23	0.341	38	0.288
21	Casa Verde	28	0.774	25	0.458	22	0.336	32	0.285
56	Pari	29	0.775	29	0.473	28	0.354	44	0.291
8	Belém	30	0.781	38	0.536	41	0.433	82	0.322
88	Vila Leopoldina	31	0.784	39	0.543	42	0.44	86	0.327
86	Vila Guilherme	32	0.787	28	0.471	26	0.35	39	0.288
27	Cursino	33	0.794	32	0.504	33	0.388	63	0.302
85	Vila Formosa	34	0.811	27	0.47	24	0.343	33	0.285
54	Morumbi	35	0.844	52	0.639	66	0.548	95	0.399
6	Barra Funda	36	0.846	51	0.639	65	0.546	94	0.394

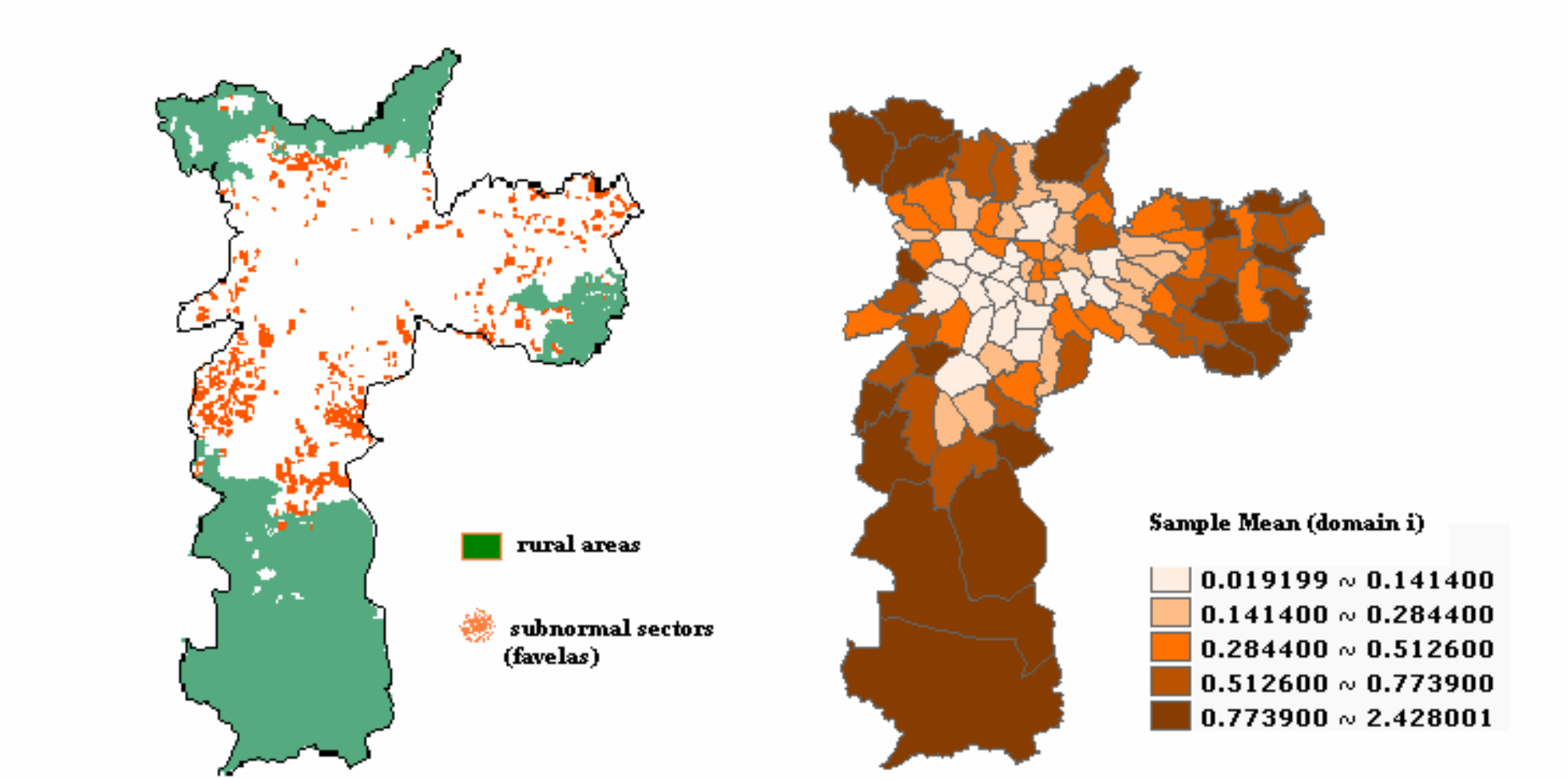
district		mean(q)		Absolute-Gini		BDP		Polarization	
number	name	order		order	index	order	index	order	index
91	Vila Matilde	37	0.847	31	0.485	29	0.355	36	0.287
59	Penha	38	0.87	36	0.531	37	0.405	64	0.302
40	Jaguara	39	0.92	34	0.526	34	0.391	48	0.293
29	Freguesia do Ó	40	0.936	35	0.53	35	0.392	47	0.293
93	Vila Prudente	41	0.942	43	0.579	43	0.449	75	0.313
9	Bom Retiro	42	0.942	46	0.619	51	0.495	87	0.334
10	Brás	43	0.968	44	0.596	46	0.463	78	0.316
72	São Lucas	44	0.99	40	0.556	38	0.414	52	0.295
34	Ipiranga	45	1,001	54	0.649	55	0.519	88	0.338
78	Sé	46	1,010	37	0.535	32	0.385	35	0.287
64	Ponte Rasa	47	1,045	41	0.567	39	0.418	45	0.292
92	Vila Medeiros	48	1,061	42	0.571	40	0.419	46	0.293
4	Aricanduva	49	1,062	45	0.603	45	0.458	67	0.305
5	Artur Alvim	50	1,090	48	0.627	49	0.48	72	0.309
50	Limão	51	1,094	47	0.626	48	0.476	71	0.309
63	Pirituba	52	1,127	53	0.642	50	0.487	73	0.31
38	Jabaquara	53	1,163	60	0.718	70	0.567	89	0.34
18	Cangaiba	54	1,179	49	0.633	47	0.47	62	0.301
95	São Domingos	55	1,223	58	0.697	59	0.532	81	0.321
94	Vila Sônia	56	1,225	74	0.8	84	0.645	93	0.384
47	José Bonifácio	57	1,271	55	0.679	53	0.511	66	0.304
68	Sacomã	58	1,321	63	0.728	67	0.552	79	0.318
65	Raposo Tavares	59	1,351	56	0.687	52	0.505	59	0.299
89	Vila Maria	60	1,361	69	0.762	73	0.593	83	0.322
24	Cidade Lider	61	1,362	57	0.688	54	0.511	54	0.297
74	São Miguel	62	1,365	59	0.698	56	0.519	60	0.299
73	São Mateus	63	1,427	64	0.728	64	0.545	65	0.302
37	Itaquera	64	1,464	62	0.728	61	0.537	61	0.299
67	Rio Pequeno	65	1,468	82	0.878	90	0.691	91	0.362
28	Ermelino Matarazzo	66	1,505	61	0.723	58	0.528	51	0.294
39	Jaçanã	67	1,509	76	0.824	80	0.632	84	0.324
76	Sapopemba	68	1,590	67	0.752	68	0.556	50	0.294
23	Cidade Dutra	69	1,618	78	0.832	77	0.625	77	0.315
17	Campo Limpo	70	1,637	79	0.834	79	0.629	74	0.311
46	Jardim São Luís	71	1,663	73	0.791	72	0.582	57	0.298
84	Vila Curuçá	72	1,699	70	0.769	69	0.562	40	0.29
22	Cidade Ademar	73	1,725	80	0.85	81	0.635	70	0.308
13	Cachoeirinha	74	1,733	85	0.894	89	0.681	80	0.318

district		mean(q)		Absolute-Gini		BDP		Polarization	
number	name	order		order	index	order	index	order	index
31	Guaianases	75	1,761	65	0.736	57	0.52	24	0.282
57	Parque do Carmo	76	1,764	84	0.891	87	0.679	76	0.314
41	Jaguaré	77	1,775	95	1,077	96	0.848	96	0.431
42	Jaraguá	78	1,778	68	0.755	63	0.545	28	0.284
36	Itaim Paulista	79	1,835	72	0.784	71	0.569	34	0.285
19	Capão Redondo	80	1,838	77	0.828	75	0.604	49	0.294
11	Brasilândia	81	1,859	75	0.818	74	0.596	42	0.291
87	Vila Jacuí	82	1,924	87	0.908	88	0.679	68	0.305
96	Lajeado	83	2,018	71	0.772	62	0.545	19	0.278
81	Tremembé	84	2,042	93	1,020	94	0.77	85	0.326
61	Perus	85	2,094	89	0.915	86	0.669	58	0.299
44	Jardim Helena	86	2,211	83	0.886	82	0.638	31	0.285
43	Jardim Ângela	87	2,290	81	0.872	78	0.626	25	0.282
58	Pedreira	88	2,312	91	0.979	91	0.711	55	0.297
75	São Rafael	89	2,342	94	1,022	93	0.747	69	0.307
83	Vila Andrade	90	2,352	96	1,136	95	0.82	92	0.378
30	Grajaú	91	2,402	88	0.912	85	0.647	26	0.283
3	Anhanguera	92	2,521	92	0.996	92	0.736	37	0.288
25	Cidade Tiradentes	93	2,558	66	0.743	60	0.536	27	0.284
33	Iguatemi	94	2,780	90	0.933	83	0.641	21	0.279
55	Parelheiros	95	3,088	86	0.903	76	0.613	18	0.272
52	Marsilac	96	3,983	50	0.633	36	0.398	22	0.28

Source: Authors' calculations from IBGE-CENSO 2000.

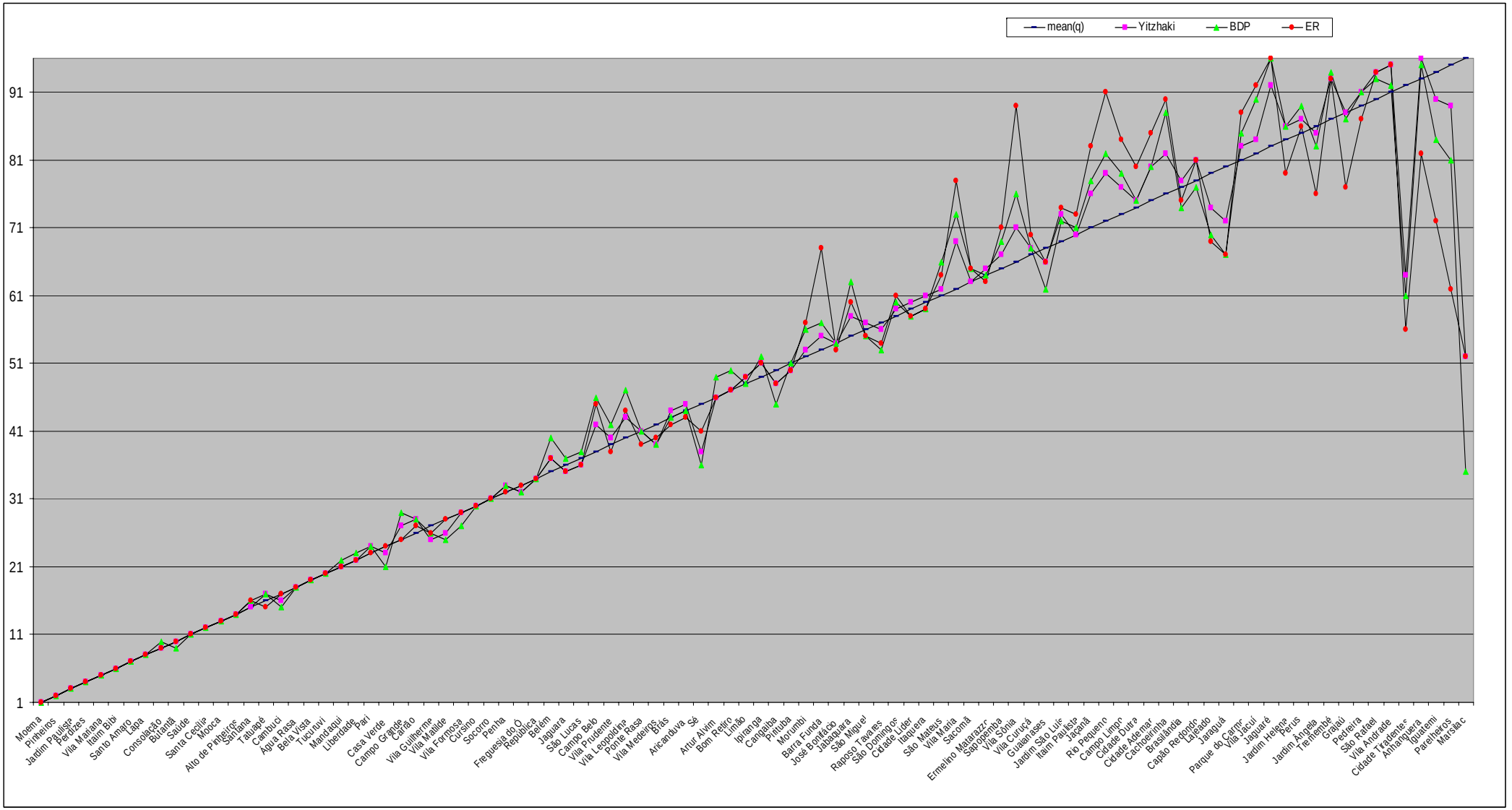
Figures:

Figure 1: Favelas, Rurais and Sample Mean of Variables in Domain i).



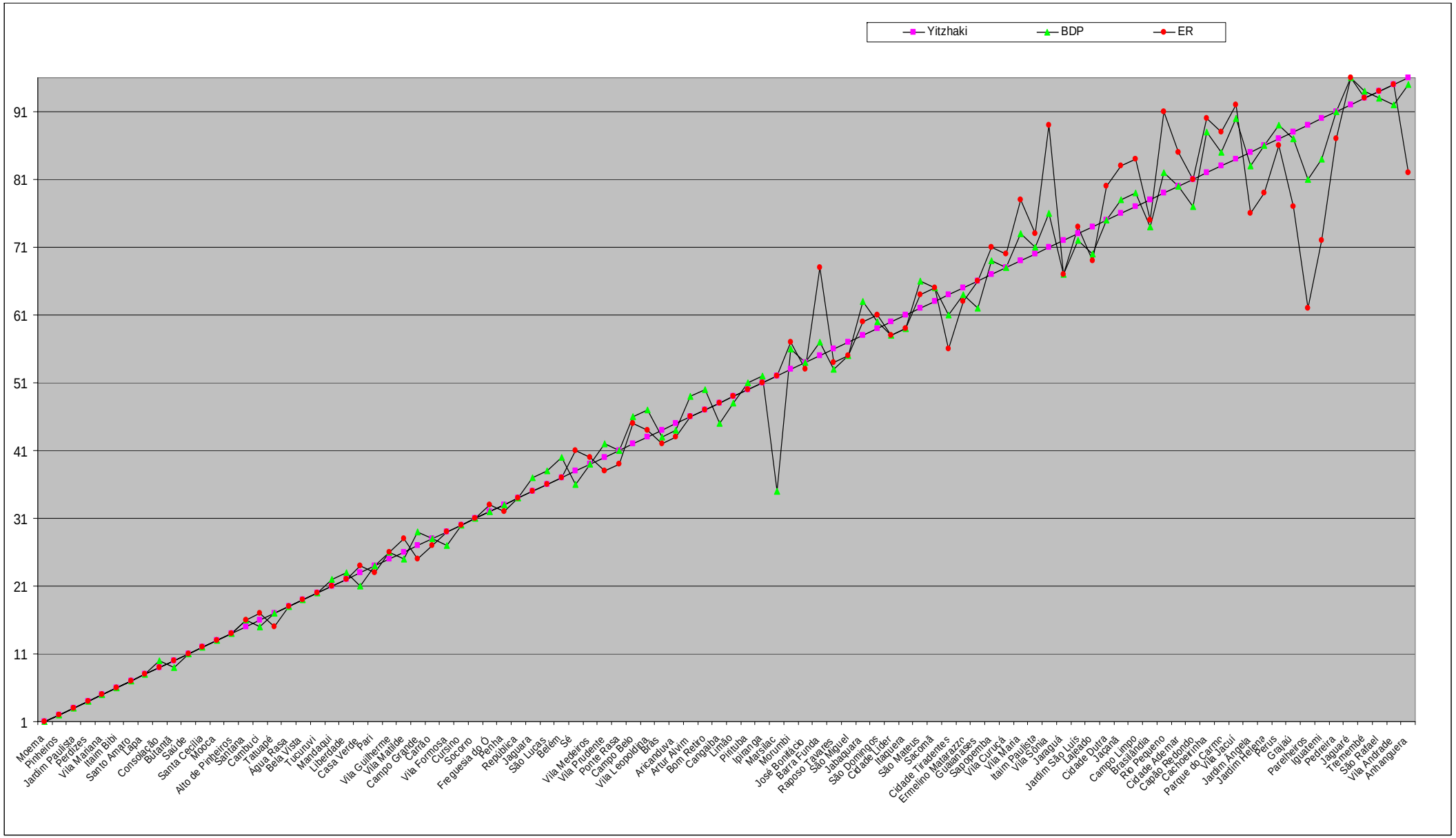
Source: Author´s elaboration/calculation from IBGE-Censo 2000.

Figure 2: Rankings – Deprivation Indices vs Sample Mean – Domain i)



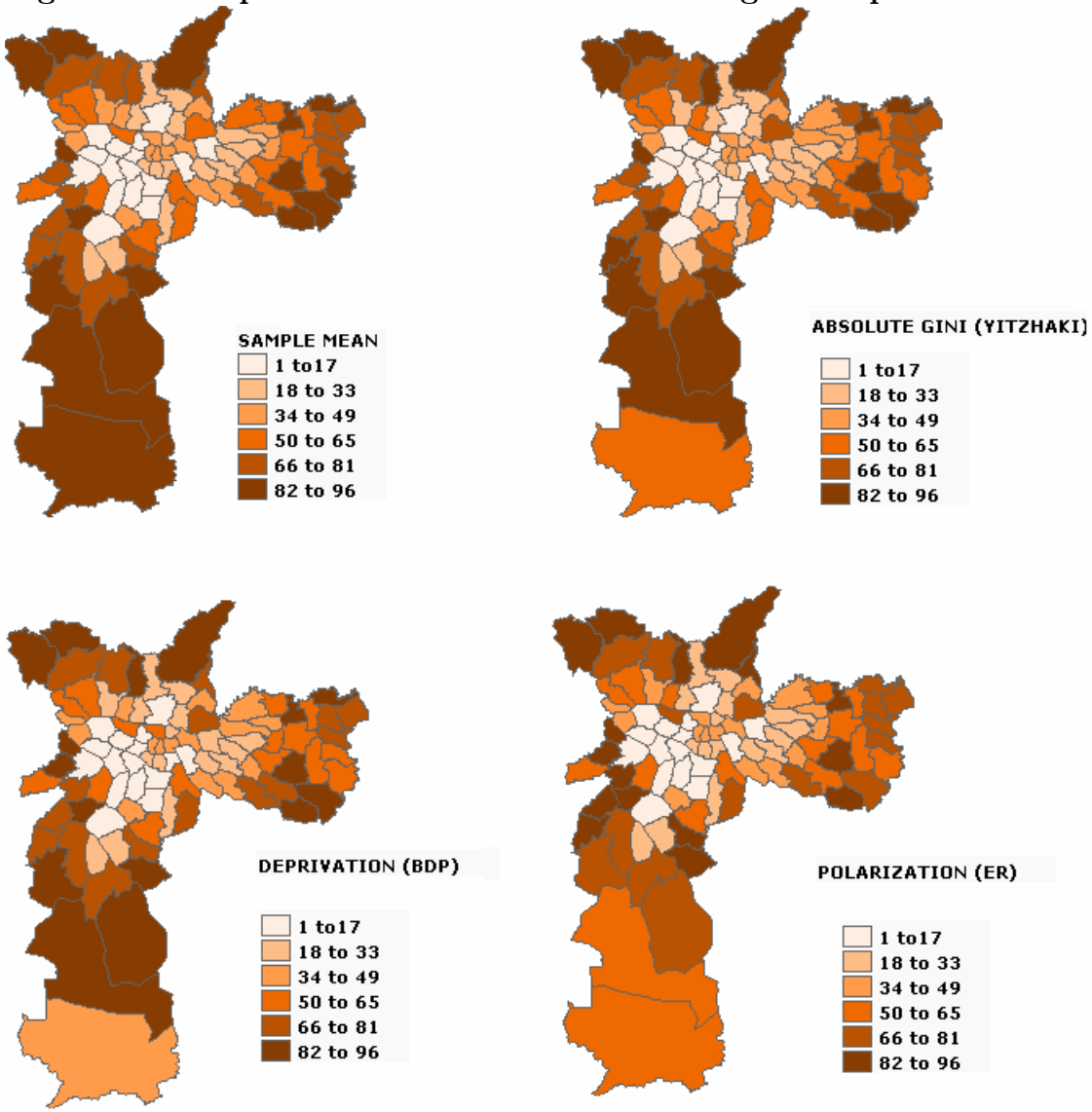
Source: Authors' calculations from IBGE-CENSO 2000.

Figure 3: Rankings – Deprivation Indices – Domain i)



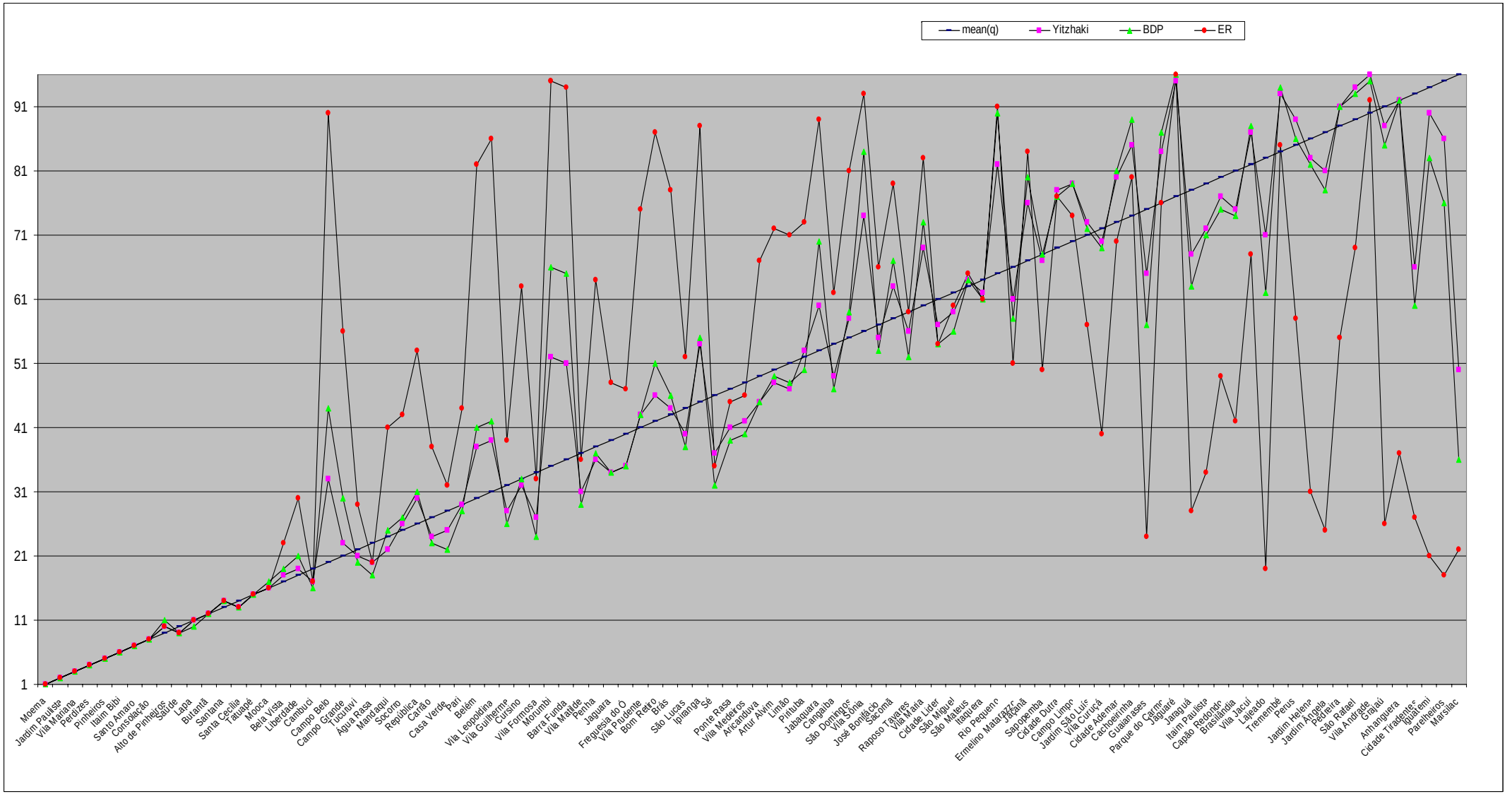
Source: Authors' calculations from IBGE-CENSO 2000.

Figure 4: Groups of Districts Based on Rankings of Deprivation Indices and of the Sample Mean – Domain i)



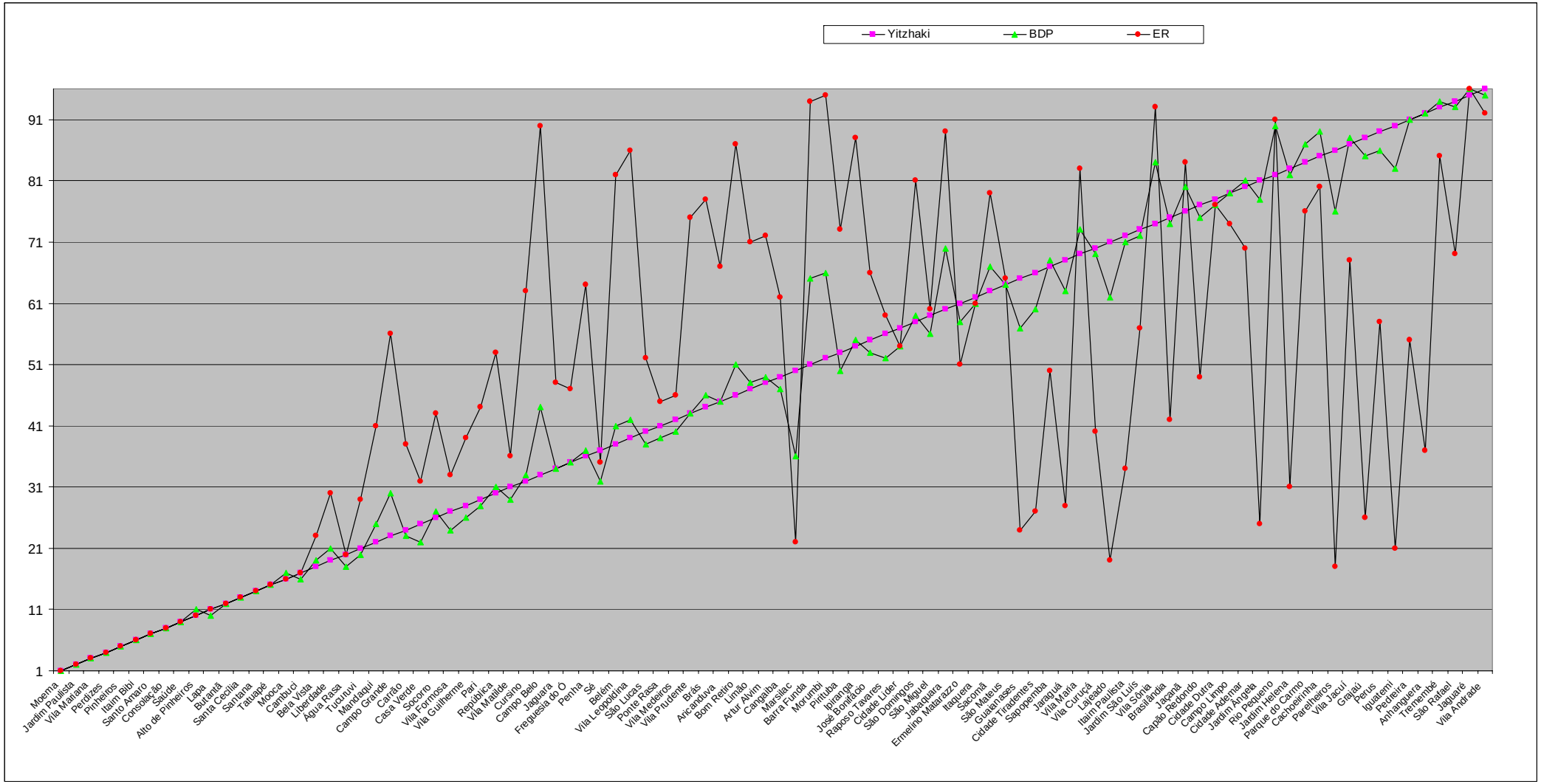
Source: Author´s calculation from IBGE-Censo 2000.

Figure 5: Rankings – Deprivation Indices vs Sample Mean – All Domains



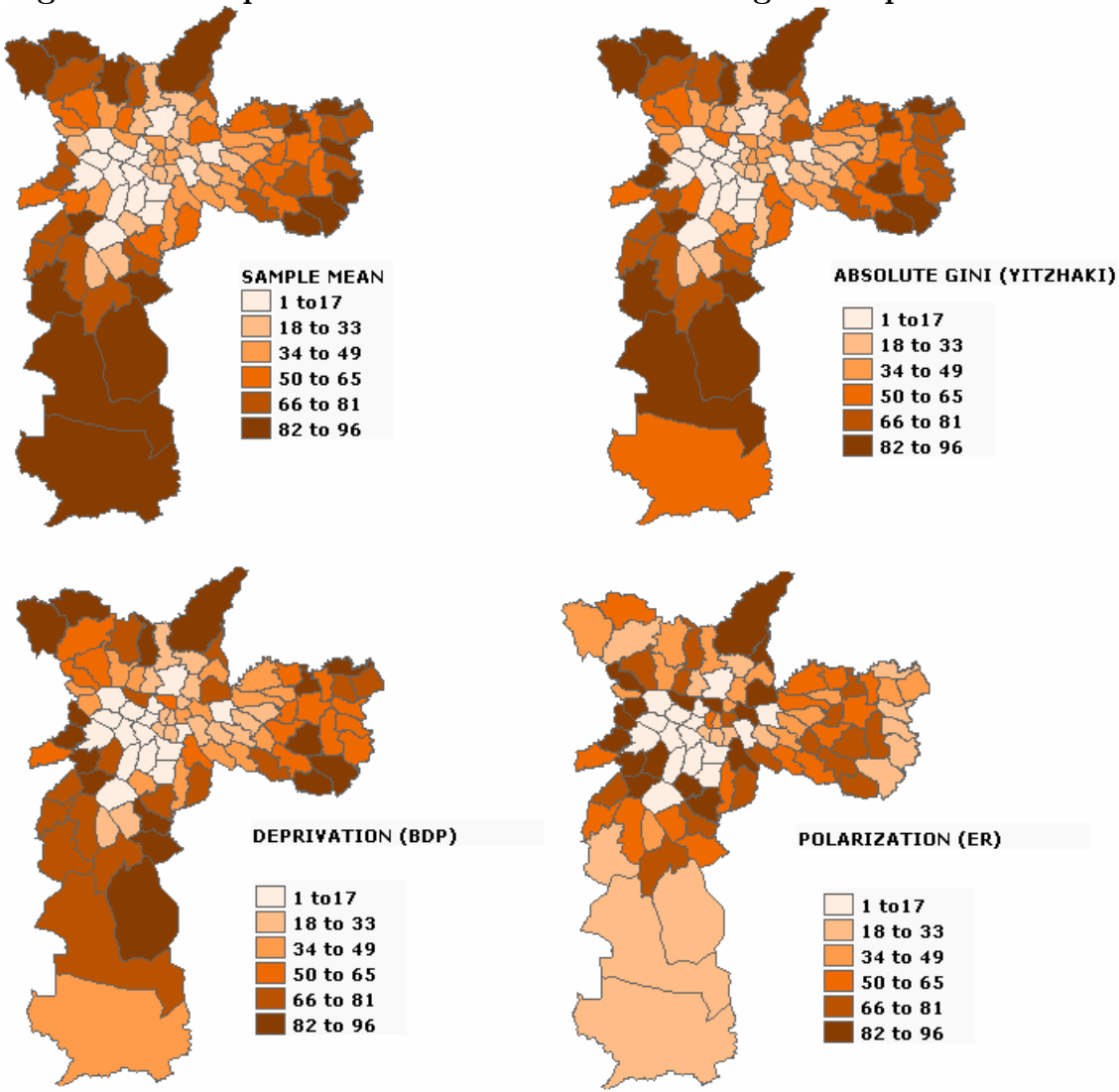
Source: Authors' calculations from IBGE-CENSO 2000.

Figure 6: Rankings – Deprivation Indices – All Domains



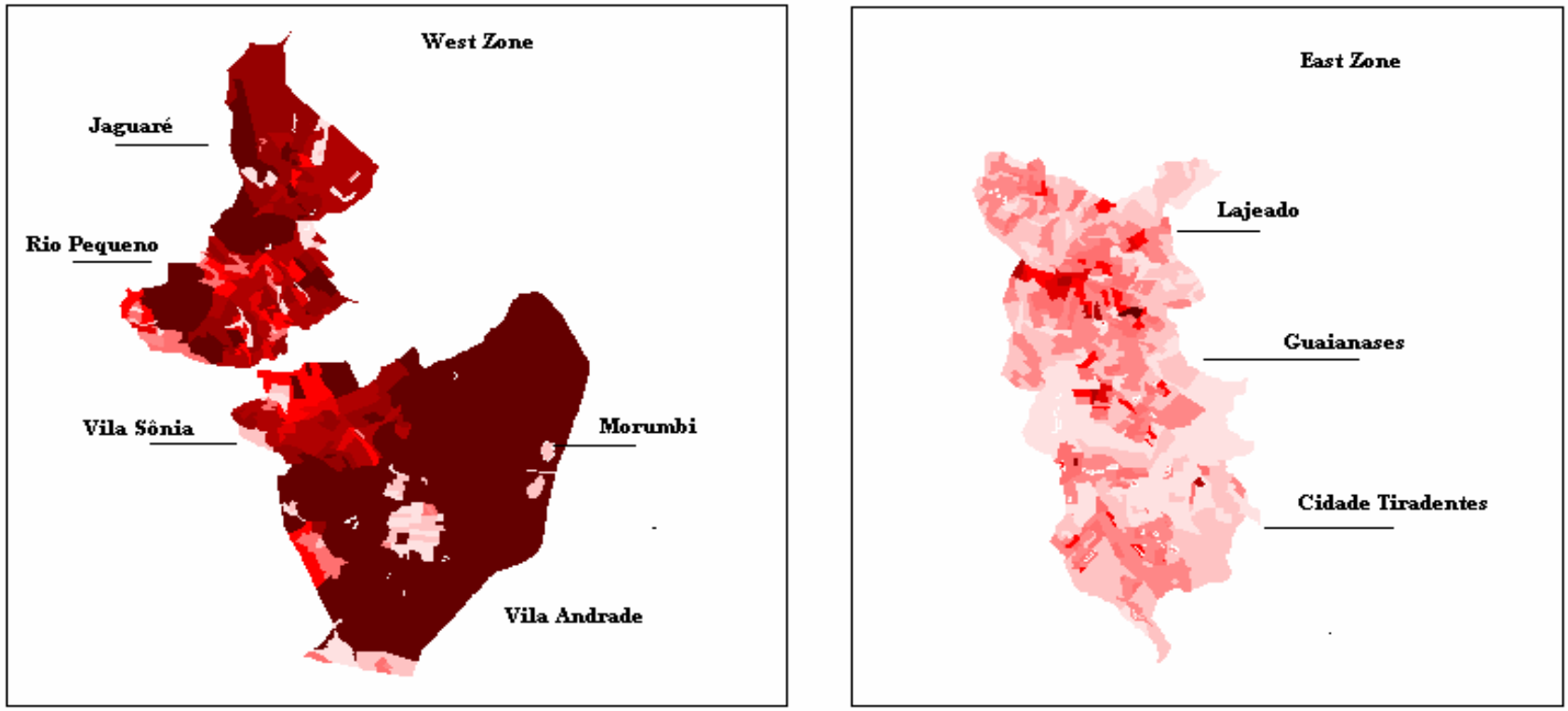
Source: Authors' calculations from IBGE-CENSO 2000.

Figure 7: Groups of Districts Based on Rankings of Deprivation Indices and of the Sample Mean – All Domains



Source: Author´s calculation from IBGE-Censo 2000.

Figure 8: Examples of Polarized and Homogeneous Districts.



* Household head mean income by censitary sector.

Source: Author´s elaboration from IBGE Censo 2000

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