Characterising Polarisation: an Application to Income Distribution in Urban uruguay

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Abstract

The spatial patterns of urbanization have taken many forms in developing countries. In Uruguay, as in other parts of Latin America, many of the 'new poor' have been forced to leave their traditionally integrated neighborhoods and move to the one of the growing marginal neighborhoods surrounding urban areas. These individuals have become excluded from access to employment opportunities, many basic services and social capital. The concentration of the poor in marginal neighborhoods exacerbates the exclusion process as these neighborhoods are often geographically isolated, have high levels of crime and violence, low levels of services, little public space, and generate an area stigma which affects access to labor markets and social networks. In this study we adopt a two stage methodology to analyze the spatial aspects of social exclusion: First we characterise the process of geographical social exclusion examining the distribution of regional incomes relative to national, and within-region individual incomes relative to the income of the region. To characterise the process of polarisation, we decompose income inequality into measures of between and within-area inequality. Second, by discretising the joint probability distribution of income by quantiles and area of residence we model the change in the evolution of the income distribution as a function of the different individual attributes and area based characteristics. Our modeling approach accounts for spatial heterogeneity in the sense that we allow for model parameter to vary across regimes, where the regimes are defined as groups of areas.

1. Introduction

In many developing countries the characteristics of the urban poor go beyond the traditional definition of poverty. While the latter generally refers to the lack of access to material resources, there are other factors which contribute to poverty. In the case of Uruguay there is a growing problem of stratification and polarization between subgroups in the population, particularly the poor and non-poor, characterized by social exclusion. Social exclusion is defined in the literature as a multidimensional process which weakens the links between individuals and the rest of society. These links can take a number of forms, including economic, political, socio-cultural and geographical perspective.[1] The economic dimension refers to processes that hinder individuals from gaining financial resources through labor markets, credit and insurance markets, basic services, and land. The political dimension of exclusion refers to individuals lacking the necessary rights that would enable them to exercise their legal freedom and participate in the decision-making. Political exclusion particularly affects the poor as they do not have the same access to education and information. The social-cultural dimension of exclusion is linked to the isolation of specific groups through education, language, and ethnic practices. Finally the geographic component refers to the negative effect of location externalities on individual attributes.

In Uruguay, the process of social exclusion is relatively new, and it is particularly visible given that the country has traditionally been characterized as a homogenous society, with the most equal distribution of income in Latin America[2].

[1] ILO, 1996

[2] Cepal, Panorama Social, 197, Santiago, Chile, and Inter-American Development Bank, Facing up to Inequality in Latina America, 1998, Washington, D.C.

There are no major ethnic groups which are typically among the excluded, and generous welfare policies over the past decades have ensured that most Uruguayans receive access to basic health, education and other services. Historically, neighborhoods were quite heterogeneous, with households of varying welfare levels living side by side and sharing the same public space. This integration provided a social cohesion between individuals of different cultural and socio-economic backgrounds.

Patterns of within and between area income inequality have been evident in recent years, with the emergence of a *new poor* resulting from job losses during the recession in the mid-nineties and other changes in the labor market, which has contributed to an increasing segmentation in Uruguay society. Many of these individuals have been forced to leave their residences in middle class neighborhoods where rents are high, and have moved into one of the growing marginal neighborhoods surrounding Montevideo and other urban areas. These individuals are excluded from access to employment opportunities, services, and social capital. The concentration of the poor in marginal neighborhoods or residential segmentation, exacerbates the exclusion process as these neighborhoods are often geographically isolated, have high levels of crime and violence, low levels of services, and generate an area stigma which affects access to labor markets and some social networks.

Poor areas are not just poor because household with specific attributes are geographically concentrated. As outlined in other recent research there may be spatially correlated heterogeneity in unobserved household characteristics (Ravallion and Wodon (1999)) deriving from the spill-over effects of geographical location on the return to individual quasi-fixed attributes (education, experience, etc.). In this respect it is important to distinguish between individual characteristics and the variable returns to those characteristics that arise from differences in location. The inclusion of spatial effects takes into account the presence of spatial heterogeneity, thus solving one of the problems originally highlighted by Shorrocks (1976), who showed that the process governing income mobility is not first-order Markov in the sense that individuals do not have the same transition rates regardless of their past income history.

If time is taken into account, then geographical spill-over effects exacerbate the polarization process by magnifying the social exclusion outcomes. In line with the findings of Quah (1997) based upon a study of the evolving distribution of incomes across countries, distribution of individuals along income and geographical dimensions may result in a *polarization* effect with a clustering of poor people in a very poor areas and of upper income households in the richer areas. This results in a bi-modal distribution, where the modality has a geographical expression. More generally, if more than two peaks emerge, a *social stratification* process may be detected.

In this study we adopt a two stage methodology: *i*) first, using the work of Shorrocks (1976) and Quah (1997) we characterise the process of geographical social polarisation examining the distribution of area-based incomes first using the share of area and quantile based population (relative to national) as the reference distribution, and second examining within-area individual incomes relative to the income of the area; *ii*) we then discretise the joint probability distribution of income by quantiles and area of residence and model the change in the evolution of the income distribution as a function of the different individual attributes and area based characteristics. Given that our data is not a panel we cannot model transition probabilities. However, using group data our objective is to explain frequencies of the form $p_{ij,kl}$ which represents the proportion of individuals who in period $t(t+1)$ were in the income decile $i(j)$ and resided in area $k(l)$. We construct a parametric model of these probabilities with covariates measuring the different attributes for any two areas. Our modeling approach accounts for spatial heterogeneity in the sense that we allow for model parameter to vary across regimes, where the regimes are defined as groups of areas. The modelling approach extends the results of spatial econometrics (Anselin (1988)) to the traditional switching-regression models extensively studied in a time-series context (Goldfeld and Quandt (1973); Terasvirta and Anderson (1992)).

2. Characteristics of peripheral neighborhoods

Poverty estimates, based upon a survey of the Inter-American Development Bank (1998)[3], shows a substantial decline in poverty in Uruguay, particularly since the late eighties. This in part, reflects an overall improvement in macroeconomic growth, despite some fluctuation, and a relatively progressive social sector spending. The second half of the 1980s, excluding a slowdown of 1988-1989, represented a rebound from the severe economic recession between 1981 to 1984. During the early 1990s, prudent fiscal management and a favorable external environment led by the economic recovery in Argentina and the decline in world interest rates helped to further improve Uruguay's economy. Annual GDP growth, which had averaged less than 1 percent between 1988 and 1990 increased to 4.4 percent from

[3]'Facing up to Inequality in Latina America', Inter-American Development Bank, 1998, Washington, D.C.

1990 to 1994. The regional financial crisis in 1994-1995 negatively affected the economy, though growth improved dramatically to over 5 percent in 1996.

Living conditions have improved as well, but still both in Montevideo and the other interior urban areas in Uruguay, there are many poor areas where many households have unsatisfied basic needs.

There are two principal types of peripheral areas in Uruguay. The first, "asentamientos irregulares" or irregular settlements (slums) were largely settled by the 'new poor' in recent years. The second, 'cantegriles' or shanty towns have been in existence for a long time and are home to the chronic poor[4]. Both types of marginal neighborhoods can be characterized as areas with high concentration of unsatisfied basic needs, low levels of education in the household and high percentages of school dropout. Local labour markets are characterised by high unemployment, labor instability, and gender discrimination. The geographic dimension exists in the form of territorial isolation and area stigma.

Irregular settlements. The number of irregular settlements has increased throughout the country, particularly in Montevideo where the estimates are 30,000 households (122,500 individuals)[5], representing about 12 percent of the cities' population. The increase in Montevideo, where the majority of the settlements are located has been estimated at about 10 percent per year between 1984 and 1994. Most of these settlements are located in a belt around the city.

The irregular settlements are characterized by social and economic marginalization, irregular land ownership, and low standard sanitary and environmental

[4] The term Cantegril for the neighborhoods originated as a form of humor as it refers to an exclusive night club in the wealthy resort town of Punta del Este.

[5] INE, "Relavamiento de los Asentamiento Irregulares, Montevideo, 1998.

conditions. Many of the residents are squatting on land which is not regulated. Because the neighborhoods have evolved in a relatively short span of time, they do have poor social and economic infrastructure such as sewage and public transportation. The population in these settlements have come from many different areas. A 1994 survey showed that over seventy percent of residents came from other neighborhoods. Fifty-seven percent came from houses or apartments, indicating that it is likely that their living conditions have significantly deteriorated. Half of the residents report having moved to the settlements due to economic difficulties, 40 percent came from cantegriles. The majority (86%) are less than 41 years old, and have a high number of children under 10 (33.5%) in relation to the total population (18.5%)[6]. Housing is generally overcrowded, with over one half of the households having five or more inhabitants. About 40 percent of those over 12 are unemployed, and those who do work are employed as domestic workers, laborers, street vendors, and garbage collectors.

Cantegriles.

The conditions in the Cantegriles are generally worse than the irregular settlements, considered to be areas of extreme poverty. They can be described as having precarious housing made of scrap materials such as wood, nylon or carton, and are very small. The cantegriles are quite visible, forming a belt around the city. They are predominately inhabited by "hugadores", who collect and sort garbage by horse and cart around the city in search of recyclable materials and food. The neighborhoods have few services and sanitation is a major problem.

[6]INTEC: Relaviemento de Asentamientos Irregulares de Montevideo (1994) en Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente, Comision para la Normalizacion de Asentamientos Irregulares, Montevideo, 1996.

Many residents have been born there as it is very difficult to move out.

3. Characterising Polarisation

Cross-country models of economic growth in the vein of Barro and Sala-I-Martin (1991), Barro and Sala-I-Martin (1992), and Blanchard and Katz (1992), have sought to establish the role of initial conditions (i.e. base year per capita income), focussing upon time averaged distribution of income across some cross-sections of regions or countries. In this study we characterise and explain a relatively neglected property of income distributions, namely the process of polarisation (or stratification) which is manifest at the geographical level. Thus, whereas convergence studies emphasise the *between region* component of differences in income distributions, polarisation depends upon both between and within region distributions. To do this we use an additively decomposable inequality index, which has been shown to have a number of desirable features. For example, Salas (1999), demonstrates these properties both in absolute terms and also relative to a number of undesirable characteristics of both β and σ convergence.

3.1. Polarisation Along Geographic Lines

In order to characterise the process of social exclusion we first re-examine a number of stylised facts. Uruguay has had the most equal distribution of income in Latin America. Note that this statement is consistent with two very different economies. For example, one might envisage an economy with an extremely equal distribution of income but with the coexistence of rich and poor areas. However, for the same overall level of equality, there is another economy where all regions may be regarded as representative of the economy as a whole. In the case of Uruguay, where most neighbourhoods were comprised of heterogeneous populations both in terms of per capita income and socio-economic backgrounds, we are alluding to the latter economy. Third, many individuals in middle class neighborhoods where rents are high, have been forced to leave their residences and have moved to one of the growing marginal neighborhoods surrounding Montevideo and other urban areas. As a result, the process of social exclusion is manifest in increasing geographical clustering of the poor. Based upon these characteristics we now present a formalised analysis of polarisation.

For any economy comprised of R disjoint regions there are a number of characteristics which may be used to represent the evolving geographic distribution of income. Quah (1997) highlights a number of these including the persistence of regional income disparities, mobility, and the process of polarisation (or in more general terms stratification). The question of whether the change in the regional distribution of income over time can be usefully presented as the outcome of polarisation is of particular relevance for this study. Although social exclusion is both multidimensional and in essence unobservable in terms of measurement, a central component is the interface between labour market dynamics and place of residence. To capture this particular dimension of exclusion we examine the income distribution. In Figure 1 we take a simple two region economy and characterise area-based polarisation. In periods t and $t+s$ we overlay the income distribution of the two populations in area a and b. Since $\mu_a^t = \mu_b^t$ and $\sigma_a^t = \sigma_b^t$ this is indicative of a situation where the *within-area* component of inequality are identical and the *between-area* component is zero[7].However, in period $t+s$ we present the outcome

[7]This assumes that the population in both areas are the same.

of a geographical sorting of individuals by income (largely driven by migration) which is manifest in a bimodal (over areas) income distribution. In fact in $t+s$ the middle income quantile disappears from region a (while the upper and lower quantile still remain) and it moves to the lowest income quantile in region b. The clustering of poor generates a cumulative effect and produces a shift of the mean of the income distribution to the left. In this situation *between area* inequality will increase. Note that we have depicted polarisation as a situation where the within area inequality is higher for region a than for region b.

We wish to examine the joint distribution of per capita income (y) and area of residence (r) in period t. We denote this bivariate distribution by $F_y^t(y^*, r)$ which gives the proportion of the population, in period t, with income less than or equal to y^* *and* resident in region r. In order to formalise this discussion we introduce the following notation. Let $\mathbf{Y}^t = (\mathbf{y}_1^{'}, \mathbf{y}_2^{'}, ..., \mathbf{y}_R^{'})'$, denote a $m \times R$ matrix, where each $\mathbf{y}_r$, $r = 1, ..., R$ is a $m \times 1$ vector with element y_{ir} denoting income for individual i in region r. For each individual and each period we have information on area of residence. Letting $\overline{y}_{..}$ denote mean per capita income over all regions, and $\overline{y}_{.r}$ mean per capita income for region r, then total (TS^t), within (WS^t), and between (BS^t) sum of squares are given by

$$\begin{aligned} TS^t &= \sum_{i=1}^{m}\sum_{r=1}^{R}(y_{ir}^t - \overline{y}_{..})^2 \\ WS^t &= \sum_{i=1}^{m}\sum_{r=1}^{R}(y_{ir}^t - \overline{y}_{.r}^t)^2 \\ BS^t &= \sum_{r=1}^{R}(\overline{y}_{r.}^t - \overline{y}^t_{..})^2 \end{aligned} \tag{3.1}$$

where $TS^t = WS^t + BS^t$.

Based upon the above discussion we now present the following proposition for two time periods $t = 1$ and $t = 2$.

Proposition 3.1. *There are two necessary conditions to generate polarisation of individuals along geographic lines.*

i) $BS^2 > BS^1$ *- inter-area variance is increasing*

ii) $WS^2 < WS^1$ *- within area variance is decreasing.*

For fixed total sum of squares over the two periods ($TS^1 = TS^2$) *then i)⇔ii). If we take this process to the limit then the within area variance will collapse about a common value.*

In order to represent the changes in $F^t(.)$ over time, and provide a basis for modelling these changes, we first discretise the distribution in two directions. First, we convert individual income data into a grouped distribution, where the groups are defined by income quantiles. Second, we define the area of geographical residence. The way in which we do this has obvious consequences for the analysis. Maasoumi and Zandvakili (1990) allude to this problem in noting that inequality is obviously an intrinsically unobservable phenomenon. As such the measurement of inequality is dependent upon value judgements made by the analyst and the objective of the analysis. For example, if the process of income polarisation is manifest in the emergence of a bimodal income distribution at the extreme income levels, then it may be necessary to impose a relatively fine income intervals (such as deciles) to capture this. Similarly, if polarisation is manifest at the geographic level, with clusterings of poor and rich individuals in small neighbourhoods, then the question of geographic scale will be critical. This issue has been noted by

Harvey, Martin, and Weeks (2000) and Boldrin and Canova (2000) in the context of analysing the convergence rates of regions.

To discretise $F^t(.)$ we define a $n \times R$ matrix $\mathbf{M}^t = \{m^t_{qr}\}$ with typical element m^t_{qj} giving the proportion of individuals with income in qth quantile, residing in region r, in period t, relative to a given population. We can consider a number of variants based upon how we define the referent population. First, we define a separate population for each quantile, writing the typical element as

$$m^{t1}_{qj} = N^t_{qj} / \sum_{j=1}^{R} N^t_{qj} \tag{3.2}$$

(3.2) represents the number of individuals in qth quantile residing in area j (N^t_{qj}) relative to total population in the qth quantile. Namely (3.2) represents the inter-area allocation of the *qth quantile population.*

$$m^{t2}_{qj} = N^t_{qj} / \sum_{q=1}^{Q} N^t_{qj} \tag{3.3}$$

(3.3) represents the number of individuals in the qth quantile residing in area j relative to total population in the jth area. Namely (3.3) represents the inter-quantile allocation of the *rth area population.* If we define the referent population as the total population across quantiles and regions, then we write the typical element as

$$m^{t3}_{qj} = N^t_{qj} / \sum_{q=1}^{n} \sum_{j=1}^{R} N^t_{qj}. \tag{3.4}$$

In section 5 we utilise these shares to graphically depict the changing within and between area income distribution for both Montevideo and Uruguay as a whole.

In order to characterise the distribution of income across areas we first consider the following hypotheses

$$\begin{aligned} H_0^1 &: \sum_{i \in r} y_i^s = N_r/N \quad \forall r, r = 1, ..., R \\ H_0^2 &: y_{ir}^s = 1/N_r \quad \forall r, r = 1, ..., R \end{aligned}$$

H_0^1 represents the null hypothesis that for all areas income shares $\left(\sum_{i \in r} y_i^s\right)$ are proportional to population shares. In this respect, for each area we may think of N_r/N as our prior probabilities. H_0^2 represents the null that the within area distribution of income is proportional to total area population. Although in most circumstances both nulls will be rejected, the *extent and nature* of the departure will be useful in characterising the evolution of income distribution over R regions. For example, we might usefully characterise the process of polarisation is consistent with a departure from the null $\sum_{i \in r} y_i^s = N_r/N$ but a failure to reject $y_{ir}^s = 1/N_r$ for all r. Namely, that the process of income distribution is different from that predicted by population shares.

3.2. Inequality Measures

The properties and underlying assumptions of a class of generalised entropy inequality measures have been discussed, inter alia, by Theil (1967), Shorrocks (1980) and Maasoumi and Zandvakili (1990). It is well known that additively decomposable indices which satisfy both mean independence and population replication comprise a one parameter family, with variants generated by different values of β :

$$I_\beta(\mathbf{y}, n) = \frac{1}{n} \frac{1}{\beta(\beta - 1)} \sum_i^m \left[\left(\frac{y_i}{\mu} \right)^\beta - 1 \right], \beta \neq 0, 1. \tag{3.5}$$

The problem with this index, as demonstrated both by Theil (1967) and Shorrocks (1980) is that unless $\beta = 0$, the additive property of inequality over, both *between* and *within* sets does not hold.

The property of mean independence implies that $I(\mathbf{y},n) = I(\alpha\mathbf{y},n)$ for all $\alpha > 0$, such that the inequality measure is homogenous of degree zero in income. Given that α is a constant across all sub-groups (in this instance regions) this then allows us to work with nominal income as opposed to inflation adjusted. Below we examine a number of different variants of (3.6) based upon alternative ways of decomposing total entropy within an income distribution. First, we consider an area-based allocation of individuals facilitating an examination of the geographic component of inequality. Second, we assign individuals to income groups using quantiles. This will allow us to characterise any general changes in the shape of income distribution independent of area.

Consider a region (RG) with a population of size N^t for period t. This region is composed of R regions with N_r^t denoting the population of the rth region, such that $\Sigma N_r^t = N^t$. If we let y_i^{st} denote the income share of the ith individual then a measure of the total entropy in the whole system is given by

$$H(y)^t = \sum_{i=1}^{N^t} y_i^{st} \log(1/y_i^{st}) \tag{3.6}$$

with minimum value of 0, representing maximum inequality and maximum value of log N denoting perfect equality such that $y_i^t = 1/N \quad \forall_i$. We first impose an area-based delineation on RG, such that for area r we have N_r^t individuals and $\sum_{r=1}^{R} N_r^t = N^t$. Dropping the time superscript for notational clarity, we may now rewrite (3.6) as

$$H(y) = \sum_{r=1}^{R} \left[\underbrace{\sum_{i \in r}^{R} y_i^s \log(1/y_i^s)}_{A} \right] \tag{3.7}$$

where A can be further decomposed as

$$\begin{aligned}\sum_{i\in R} y_i^s \log(\frac{1}{y_i^s}) &= Y_r \sum_{i\in r} \frac{y_i}{Y_r}\left(\log\left(\frac{1}{y_i^s/Y_r}\right)+\log\left(\frac{1}{Y_r}\right)\right) \\ &= \underbrace{Y_r \sum_{i\in r}^{R} H^r(y)}_{C} + \underbrace{Y_r \sum_{r=1}^{R} \log\left(\frac{1}{Y_r}\right)}_{B},\end{aligned} \tag{3.8}$$

where $Y_r = \sum_{i\in r} y_i^s$ denotes the income share for region r, and $H^r(y) = \sum_{i\in r} \frac{y_i}{Y_r} \log(\frac{1}{y_i^s/Y_r})$. We see that (3.6) can be decomposed into the additive sum of the *between-area* entropy (B) and the weighted average of the *within-region* entropies (C).

As noted by Theil (1967), the principal disadvantage of (3.8) is that the value of between region entropy is maximised for $Y_r = 1/R, \quad \forall r = 1,...,R$. However, since N_r^t is not a constant this implies the existence of between area per capita differences given a uniform distribution of total income over R areas. By a simple adjustment to (3.8) we can correct for this problem writing

$$\begin{aligned}I(\mathbf{y},n) &= \log N - H(y) = \log N - \sum_{r=1}^{R} Y_r H^r(y) - \sum_{r=1}^{R} Y_r \log(1/Y_r) \\ &= \sum_{r=1}^{R} Y_r \log\left(\frac{Y_r}{N_r/N}\right) + \sum_{r=1}^{R} Y_r[\log N_r - H_r(y)].\end{aligned} \tag{3.9}$$

The first term on the right hand side of (3.9) denotes the *between area* inequality and the second term is the *within area* measure.[8]

For the *between area* component the referent (or prior) probabilities are the area population shares N_r/N; for the *within* area component the referent probabilities are uniform on $1/N_r$. By considering the actual data as posterior probabilities

[8]Note that by subtracting $H(y)$ the entropy measure from its maximum value log N, we transform an equality measure into an inequality measure.

it is instructive to rewrite (3.9) as

$$I(y,n) = \log N - H(y) = \sum_{r=1}^{R} E^B_{Y_r}[\log(Y_r) - \log(N_r/N)] + \sum_{r=1}^{R} E^w_{Y_r}\left[\sum_{i\in r}^{R} E_{y_i/Y_r}[\log(y_i/Y_r) - \log(1/N_r)]\right] \quad (3.10)$$

where $E[.]$ denotes the expectation operator. The first term on the right hand side of (3.10) represents the total reduction in uncertainty (given N_r/N) with respect to the *between area* income distribution and the second term represents the same (given $1/N_r$) with respect to the total *within-area* uncertainty.

Although each term is positive, the rth component may be positive or negative. For example, if $E^B_{Y_r}[.]$ is negative this implies that $Y_r < (>) N_r/N$. Further for a constant level of inequality, if $\sum E^B_{Y_r}[.]$ is increasing then $\sum E^w_{Y_r}E[.]$ must fall. However, this relationship need not hold for individual elements. For example, an area whose between area value $E^B_{Y_r}$ is negative (i.e. the share of *total* income for region r is less than that predicted based upon the population share) and increasing can also have an increasing value of $E^w_{Y_r}$ (i.e. *within region* inequality is high).

An alternative decomposition allows us to examine within and between quantile inequality, and in doing so characterise general changes in the income distribution. Thus, rewriting (3.10) substituting an allocation by quantile, we have

$$I(\mathbf{y},n) = \log N - H(y) = \sum_{q=1}^{Q} E^B_{Y_q}[\log(Y_q) - \log(N_q/N)] + \sum_{q=1}^{Q} E^w_{Y_r}\left[\sum_{i\in q}^{Q} E_{y_i/Y q}[\log(y_i/Y_q) - \log(1/N_q)]\right] \quad (3.11)$$

where $Y_q = \sum_{i\in q} y^s_i$ (N_q/N) is the income (population) share of the qth quantile.

For both area-based and quantile based decompositions it is important to point out the importance of the allocation mechanism. Obviously total inequality within a economic system comprised of N individuals is a constant, independent of the number of groups used to partition the total population. However, the decomposition in terms of between and within group inequality will depend, in part, on the number of bins. The comparison also depends on the number of groups (i.e. regions and quantiles) used. For example if we let the number of groups approach the number of individuals (N) then obviously within group inequality will disappear. As such, the critical issue is to decide the appropriate partition of N based upon informed judgment. In the case of an area-based grouping, area should be large enough such that an investigation of within area inequality is worthwhile, but small enough in the sense of representing communities with minimum degrees of homogeneity.

4. Data

The data used is from the Continuous Household Survey carried out biannually in urban areas throughout Uruguay. The survey asks questions on income, labor force participation, household characteristics, and demographics of members of the household. The sample frame for the 1989, 1992, and 1996 data sets is drawn from the 1986 National Census. For each period we have data for a random sample of N_t individuals, and note that as such we have three independent random samples. Given that the data does not track changes in income at the level of the individual we cannot make reference to mobility per se. However, we can both describe and explain difference in the income distribution at different points in time.

Table 5.1 reports summary information for each of the 19 departments[9], which represent the highest level of geographical division in Uruguay. Within each department there are administrative partitions (census sections) which provide more information of the location of the individuals within each department. As Table 5.1 shows most of the population is concentrated in the capital Montevideo. For Montevideo we have an additional geographical classification which provides the specific area of residence (24 in total) where residence is the "census section".

5. Results

In Table 5.2 we present summary statistics for both Montevideo and Uruguay based upon an allocation of individuals to quantile income groups. We use real income figures where income is defined as individual household income[10] and it is deflated using the inflation rates based upon the annual consumer price index. As expected the data exhibit the positive skewness and fat-tailed characteristics for high income groups.

In order to shed more light on the relationship between geographical location and social exclusion we have further classified areas within Montevideo as peripheral or non-peripheral. An area is classified as peripheral if based upon the use of basic needs indicators there is a non zero percentage of individuals below the poverty line and a positive increase in the population within the census section. Table 5.3 presents this data with areas ranked according to the percentage

[9] A department is a specific region in Uruguay.

[10] We use real income figures where household income is constructed using income from all sources for each member of the household, including an imputed value for housing. Income sourcesinclude wages, income from self-employment, pensions, gifts and remittances, etc

of individuals below the poverty line; areas 12, 8, 15, 24, 10, 16, 20 and 9 are then categorized as peripheral. It is worth noting the significance of this binary indicator for our analysis. As stated earlier, the process of social exclusion is multidimensional and at this juncture our primary focus is on the expression of the income component over geographical areas. However, given that this regional classification affords area-based information on many of the correlates of social exclusion[11], then we may examine the extent to which income polarisation co-exists with the other dimensions of exclusion.

Summary statistics for areas in Montevideo over the period 1989, 1992 and 1996 are provided in tables 5.4-5.6. In each case the data are ranked by mean area real income. For all years a number of characteristics are notable. First, the data are heteroscedastic insofar as the number of individuals per area is not constant. Second, within area variance is increasing with income. In table 5.7 we present the correlation (ρ) between mean incomes and standard deviation for the three years 1989, 1992, and 1996. We note both high inter-year correlations for mean income, and the same for within year correlations of income and standard deviation. What does this say about polarisation? For lower (higher) average income areas the distribution of income is relatively low (high). Finally, for all years we observe a negative relationship between the average number of persons per household ($\overline{NP}$) and mean income.

Before using Theils inequality measure to examine the extent to which the

[11]The basic needs which are classified as unsatisfied are households with: low quality housing, with more than 2 people per room, no potable water source, no sewage, or shared sanitary services, with children who do not attend school or have dropped out at the primary level, and with heads of household under the age of 45 with incomplete primary education, or no education.

income distribution for both Montevideo and Uruguay has evolved according to a polarisation process, we use the area and quantile-based population shares presented in section 3 to graphically depict changes in the income distribution. In Figures 2 a), b) and c) we present the population shares across the whole of Uruguay for given deciles. In this representation the vertical axes represents the proportion of individuals in income decile i, resident in area j, with the referent population defined for each decile. Thus, for any cross-sectional slice (by decile) $\sum_{j=1}^{R} m_{ij}^{1} = 1$. We may think of these figures as depicting changes in the *between area* distribution of population for the decile population. Thus over the period 1989-1996, and for the entire income distribution we can observe a definite increase in inequality. For example, in 1989, with the exception of areas within Montevideo, the between-region distribution of population by decile was relatively uniform. In 1992 we see a change, manifest at both ends of the income distribution. For example, in area 17[12] we observe a much higher proportion of individuals from the 10th decile. However, for many of the urban interior areas (outside of Montevideo) we observe a much more uniform distribution of population relative to 1989. In 1996 this process of between area stratification continues with increased sorting of individuals for low income deciles both within Montevideo and in the urban interior areas. In particular if we examine Figure 2 c) and take a cross-sectional slice looking along the first two deciles, we see that for the peripheral areas (9, 10, 12, 15, 16, 20, 24[13]) in Montevideo and the interior area 25 (Department of Artigas in Northern Uruguay) there exists a polarisation of the lower income groups.

[12]These areas correspond to census section 18 as recorded in the original classification in codebook.

[13]Census Section 10, 11, 13, 16, 17, 21, 99.

In Figures 2 d), e) and f) we present the population shares, again for the whole of Uruguay, across deciles for *given* areas. Here we depict the *within area* component of inequality. The vertical axes represent the proportion of individuals in income decile i, area j, relative to the total population in area j such that $\sum_{i=1}^{n} m_{ij} = 1 \ \forall_j$. For all years we observe a substantial fall in *within area* inequality. For 1989 we observe pockets of high *within area* inequality in the urban interior areas outside of Montevideo. However, by 1996 within area inequality in the urban interior areas has fallen substantially, such that for many areas the distribution of population across deciles is close to uniform. In 1996 we can observe that in area 17 there is a polarisation of individuals in the upper income deciles, whilst still areas 16 and 25 exhibit the highest proportion of individuals in the lowest income decile.

Figures 2 a), b), and c) are obviously related with d), e), and f). To see this let $\Delta m_{1j}^{1}, j = 1, ..., R$ denote the one period change in the spatial distribution of income between areas for the first decile population and $\Delta m_{i1}{}^{2}, i = 1, ..., Q$ denote the one period change in the income distribution *within* area 1. More generally we might think of Δm_{1j}^{1} as being driven, in part, by the relative attributes of the R regions as perceived by individuals of the first decile population, resulting in subsequent migration decisions. Dependent upon the regional origin and destination of migrants, this process will generate, for any given area, changes in the intra-area distribution over quantiles. Note that for any two periods, if total inequality is unchanged, between are inequality can only increase at the expense of a fall in within area inequality.

In Figure 3 we focus on the areas of Montevideo with income discretised by deciles. Although to a lesser extent, we again observe a move towards increased polarisation. In Figure 3a, for example, areas within Montevideo with relative high population had a more uniform distribution of population across deciles. In 1992 this picture changes with a move towards geographic polarisation at the extremes of the income distribution (see the high concentration of individuals in the top decile for area 10, and lowest decile for area 17). Note also that for area 17 we observe a disappearance of middle income individuals. In Figures 3d, e, and f, we depict the within area distribution of population by decile. Although the pattern is not dominant, we do observe a fall in the total within-area inequality evident in an increasing trend towards an area-specific uniform distribution.

5.1. Inequality Measures: Decomposition by Area and Quantile Theil

Table 5.8 reports the results of an application of inequality index given by (3.9) for Montevideo and Uruguay. Looking at the total index, inequality increases slightly for Montevideo, with a fall for the whole of Uruguay. It should be noted that the total index, summing over all areas or all quantile income groups, masks the change in total inequality composition. For example, given an overall fall of the *within-area* inequality and an increase in the *between area* inequality over the period 1989-1996, this is suggestive of a general pattern of polarisation. For Montevideo the within inequality measure falls from 1.621 in 1989 to 1.596 in 1996, less than the fall in the Uruguay index (1.724 to 1.631). The between area inequality for the same years increases from 0.081 to 0.116 for Montevideo and from 0.079 to 0.138 for all Uruguay. Figure 10 shows the density distribution for this inequality index for Montevideo[14]. It is evident that for the period 1989-1996

[14]The density estimates were constructed using a kernel density estimation, with Gaussian kernel. The density is estimated at 128 points using a Fast Fourier transformation (see Silverman

the right tail of the density distribution becomes larger, indicating that some of the peripheral areas in Montevideo are now at the edge of the distribution with higher inequality indices.

With regards to the area-based decomposition, more detailed inference can be drawn from the figures in Table 5.9 which provide the composition of the inequality index by area. In Montevideo all peripheral areas (except area 20) exhibit a fall in the within area inequality. For example in area 10 the index falls from 0.84 to 0.77. Over the same period average income for this area falls from 74.2 to 65.1 (units?) and the standard deviation from 59.9 to 52.1. Therefore the reduction in the within area inequality implies that the distribution of income is collapsing around a lower value. In other wealthier areas, such as area 17, the within area inequality increases from 0.178 to 0.205. In this instance the average income increases over the period 1989-1996 from 169.9 to 211.1, with the standard deviation of income raises from 132.3 to 182.7. Based upon this example, there is evidence that polarization is not symmetric in the sense that poor individuals tend to cluster within specific areas, reducing both average area income and standard deviation, whereas areas with higher average income are characterized by higher within area inequality and higher income variance. It is also apparent that for all the peripheral areas the between region inequality index is negative (and increasingly so over the period 1989-1996) which implies that the distance between the actual income distribution and that predicted based upon population shares is increasing.

Table 5.10 decomposes the Theil's inequality index by quantile. Note that to find a process of stratification over income quantiles, we would need to find

(1986)).

evidence of increasing between quantile inequality, and a fall in the within quantile inequality. For example, taking the case of just three income groups, poor, middle income and rich, the disappearance of the middle income group would result in the classic bi-modal (or twin peaked) distribution. For both Montevideo and Uruguay deciles 1-6 receive less than expected income basic upon population shares, with deciles 7-10 receiving an unequal share. Further, and as we would predict, the most significant departure from the prior distribution (in absolute values) is greatest for the upper decile. Over the period 1989-1996 the departure from the uniform has fallen slightly for the first decile, whereas for the top decile between inequality component has increased substantially from 0.338 in 1989 (22.5% of total inequality) to 0.445 in 1996 (26% of total inequality). Higher within deciles inequality mirrors in the higher skewness and kurtosis results shown in Table 5.2.

Conclusions

The paper characterises the process of social exclusion using area-based incomes for peripheral neighborhoods in Montevideo and for other urban interior areas in the rest of Uruguay. We characterise and explain the process of polarisation at the geographical level by examining the distribution of income using area based and quantile based population as the reference distribution . General patterns of geographical polarization emerge with an overall fall of the *within-area* inequality and an increase in the *between area* inequality over the period 1989-1996. Based upon this example, there is evidence that polarization is not symmetric in the sense that poor individuals tend to cluster within specific areas, reducing both average area income and standard deviation, whereas areas with higher average income are characterized by higher within area inequality and higher income variance.

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Table 5.1: The Regional Division of Uruguay

Department	Population (1996)	Population per km^2
Montevideo	1.344.839	2537.4
Artigas	11.928	6.3
Canelones	4.536	97.7
Cerro Largo	13.648	6.0
Colonia	6.106	19.7
Durazno	11.643	4.8
Flores	5.144	4.9
Florida	10.417	6.4
Lavalleja	10.016	6.1
Maldonado	4.793	26.6
Paysandú	13.922	8.0
Rio Negro	9.282	5.6
Rivera	9.370	10.5
Rocha	10.551	6.7
Salto	14.163	8.3
San Josè	4.992	19.4
Soriano	9.008	9.1
Tacuarembó	15.438	5.5
Treinta y Tres	9529	5.2

Table 5.2: Quantile Based Data: 1989-1996

		Min		Max		$\overline{Inc}$		σ_{inc}		$Skew$		$Kurt$	
		M†	U††	M	U	M	U	M	U	M	U	M	U
Quantile													
	1989	3.8	0.0	45.0	35.1	31.2	24.0	9.6	7.6	-0.5	-0.5	2.4	2.5
1	1992	0.0	0.0	52.3	37.7	34.9	25.0	11.8	8.6	-0.5	-0.6	2.6	2.6
	1996	0.0	0.0	43.8	32.5	27.8	21.0	10.9	7.7	-0.6	-0.6	2.5	2.6
	1989	45.3	35.2	68.4	53.9	57.0	44.4	6.8	5.3	-0.1	0.0	1.8	1.8
2	1992	52.4	37.8	78.6	59.0	65.2	48.3	7.4	6.0	0.1	0.0	1.9	1.8
	1996	43.9	32.5	69.0	51.6	56.7	42.2	7.3	5.6	0.0	0.0	1.8	1.8
	1989	68.6	54.2	95.3	77.5	81.1	65.2	7.8	6.5	0.1	0.1	1.8	1.9
3	1992	78.7	59.1	110.1	85.8	93.1	71.8	8.7	7.8	0.2	0.1	1.9	1.8
	1996	69.0	51.6	100.5	76.1	83.9	63.3	9.1	7.0	0.1	0.1	1.8	1.8
	1989	95.7	77.7	143.8	118.4	116.3	95.1	13.6	11.5	0.3	0.3	1.9	2.0
4	1992	110.2	85.8	163.4	131.3	133.0	105.4	15.0	13.2	0.3	0.3	2.0	1.9
	1996	100.6	76.1	158.4	120.9	125.0	95.5	16.4	12.7	0.3	0.3	1.9	1.9
	1989	144.0	118.7	2510.0	5895.3	235.6	210.1	143.3	224.6	6.0	13.6	63.3	264.2
5	1992	163.8	131.4	2621.8	2621.8	274.8	228.7	160.2	147.9	6.1	6.4	67.3	75.0
	1996	158.6	120.9	3279.9	3279.9	271.4	216.2	149.5	128.0	4.6	4.7	49.7	54.9

M†: Montevideo
U††: Uruguay

Table 5.3: Peripheral Census Sections in Montevideo

Census Section	Area	Residents below poverty line (%)	Increase in Population (1985-1996) within the Census Section
13	12	45.00	21.04
9	8	16.30	17.66
16	15	15.90	13.86
99	24	16.70	9.70
11	10	18.70	6.82
17	16	13.30	6.61
21	20	12.40	6.48
10	9	3.10	2.06
24	23	0	-0.08
18	17	0	-1.66
20	19	3.30	-2.10
22	21	2.20	-2.89
12	11	0	-5.28
14	13	1.70	-5.53
15	14	0	-5.70
23	22	0	-7.19
19	18	0	-9.73
5	4	0	-10.42
7	6	0	-10.66
8	7	0	-10.83
6	5	0	-10.97
4	3	0	-13.97
3	2	0	-17.23
2	1	0	-30.15

Table 5.4: Area Based Data: Montevideo (1989)

	Min	Max	$\overline{Inc}$	σ_{inc}	$\overline{NP}$	No. Ind.
Area 15†	8.3	600	65.3	49.6	4.6	588
12†	3.8	648.0	65.8	64.4	4.7	858.0
16†	8.2	350.0	66.5	46.8	4.7	1247.0
24†	9.0	400.0	73.8	51.5	4.3	678.0
10†	10.0	575.0	74.2	59.9	4.4	1079.0
1	32.5	199.5	77.3	41.9	3.4	32.0
20†	6.8	550.0	80.3	51.0	4.2	1068.0
8†	9.7	1111.2	80.4	113.5	4.9	582.0
19	14.0	587.3	86.7	60.1	4.2	1027.0
21	13.8	416.0	87.1	55.0	4.4	831.0
18	14.3	450.0	95.8	63.2	4.5	477.0
11	14.0	561.0	105.3	68.5	4.1	999.0
2	43.5	350.0	123.3	72.5	4.0	39.0
13	17.0	657.5	123.5	92.9	3.9	503.0
9†	10.0	2510.0	128.5	126.7	3.9	2038.0
14	16.0	1070.0	129.5	103.1	4.0	457.0
4	31.0	642.0	131.6	96.2	3.4	180.0
6	39.8	700.0	134.1	112.5	3.3	226.0
3	36.8	390.0	136.5	80.1	2.9	113.0
7	31.6	605.0	137.3	88.7	3.8	205.0
23	7.9	840.5	141.5	107.7	3.7	924.0
22	30.0	1960.0	148.4	169.0	3.6	353.0
17	21.6	2300.0	169.9	132.3	3.6	1148.0
5	42.0	628.0	178.9	152.0	3.4	122.0

† Areas classified as 'Peripheral'.

Table 5.5: Area Based Data: Montevideo (1992)

	Min	Max	$\overline{Inc}$	σ_{inc}	$\overline{NP}$	No. Ind.
Area 1	65	65	65	0.0	2.0	2.0
12†	0.0	300.3	65.3	44.8	4.7	738
16†	0.0	474.5	72.3	59.2	5.0	1389
10†	11.7	543.9	76.8	51.5	4.4	1099
15†	8.1	670.2	80.3	64.2	4.0	382
24†	13.3	376.3	80.3	51.1	4.4	619
8†	12.8	504.7	92.1	62.5	4.3	553
20†	8.2	454.0	92.6	59.0	4.5	1078
19	2.9	1140.7	102.9	70.5	3.9	1032
21	0.0	701.2	108.4	76.4	3.9	740
18	0.0	558.1	111.9	68.3	4.2	432
2	27.9	523.8	113.9	85.3	2.9	91
13	0.0	1189.4	120.4	96.7	4.0	547
11	16.8	698.4	123.2	87.7	3.8	934
7	27.4	614.6	129.7	78.2	3.6	246
4	31.4	578.0	135.9	94.3	3.6	207
22	32.5	798.0	149.8	94.2	3.6	372
6	28.3	1089.6	152.7	156.2	3.4	208
9	10.7	2385.7	156.3	156.4	4.3	2288
14	11.6	1732.1	159.8	152.7	3.6	499
23	27.9	2621.8	161.3	146.5	3.8	925
5	48.0	588.2	179.3	96.6	3.0	135
3	41.9	698.4	198.9	144.7	3.1	79
17	34.7	2095.3	200.4	142.7	3.7	1123

† Areas classified as 'Peripheral'.

Table 5.6: Area Based Data: Montevideo (1996)

	Min	Max	$\overline{Inc}$	σ_{inc}	$\overline{NP}$	No. Ind.
Area 12†	0.0	476.9	63.9	51.3	4.6	1778
16†	0.0	604.7	64.0	51.6	4.6	2653
10†	0.0	834.9	65.1	52.1	4.8	2317
15†	0.0	1063.2	66.9	73.8	4.1	1048
24†	6.4	415.7	74.9	50.4	4.4	1438
8†	5.9	600.1	82.0	64.5	4.2	1170
20†	0.0	643.5	83.7	60.9	4.3	2310
19	0.0	629.8	90.2	66.3	4.0	1781
21	0.0	487.7	98.5	63.5	4.0	1514
18	0.0	617.8	100.8	76.6	3.7	750
2	18.9	397.9	102.8	71.3	3.7	157
1	39.7	288.2	109.3	61.2	3.1	56
7	0.0	1330.8	120.0	112.4	3.7	446
11	0.0	830.7	121.2	95.5	3.5	1664
13	0.0	799.4	132.9	107.0	4.2	990
9†	0.0	1374.4	145.1	122.8	4.0	4229
22	0.0	1561.2	152.8	124.7	3.5	641
14	14.4	985.9	153.9	114.7	3.3	765
23	0.0	890.2	154.1	113.7	3.6	1862
6	3.4	2566.6	159.5	164.2	3.1	451
3	50.2	508.5	164.2	97.5	3.0	241
4	18.0	1450.5	172.3	158.0	3.3	346
5	22.9	1474.0	206.0	187.9	3.1	243
17	0.0	3279.9	211.1	182.7	3.5	2230

† Areas classified as 'Peripheral'.

Table 5.7: Correlation Matrix (Montevideo)

	$\overline{Inc}_{89}$	$\overline{Inc}_{92}$	$\overline{Inc}_{96}$	σ_{89}	σ_{92}	σ_{96}
$\overline{Inc}_{89}$	1.00					
$\overline{Inc}_{92}$	0.922	1.00				
$\overline{Inc}_{96}$	0.944	0.920	1.00			
σ_{89}	0.825	0.738	0.766	1.00		
σ_{92}	0.733	0.871	0.724	0.627	1.00	
σ_{96}	0.902	0.830	0.935	0.797	0.691	1.00

Table 5.8: Theils Inequality Measure: Area and Quantile Decomposition (Totals): 1989-1996

	Between Areas		Within Areas		Total	
	Montevideo	Uruguay	Montevideo	Uruguay	Montevideo	Uruguay
1989	0.081	0.079	1.621	1.724	1.702	1.802
1992	0.084	0.107	1.615	1.648	1.698	1.755
1996	0.116	0.138	1.596	1.631	1.711	1.765
	Between Quantiles		Within Quantiles		Total	
	Montevideo	Uruguay	Montevideo	Uruguay	Montevideo	Uruguay
1989	0.355	0.417	1.345	1.385	1.702	1.802
1992	0.365	0.414	1.333	1.341	1.698	1.755
1996	0.423	0.452	1.287	1.312	1.711	1.765

Table 5.9: Inequality Decomposition by Area: Montevideo 1989-1996

	Within Region			Between Region			Total		
	1989	1992	1996	1989	1992	1996	1989	1992	1996
Area 12†	0.063	0.045	0.058	-0.020	-0.019	-0.022	0.044	0.026	0.035
Area 16†	0.089	0.099	0.085	-0.029	-0.037	-0.034	0.060	0.062	0.052
Area 10†	0.084	0.074	0.077	-0.020	-0.023	-0.031	0.064	0.051	0.047
Area 15†	0.040	0.026	0.035	-0.013	-0.006	-0.011	0.027	0.020	0.024
Area 24†	0.051	0.043	0.051	-0.011	-0.012	-0.015	0.039	0.031	0.036
Area 8†	0.057	0.044	0.046	-0.012	-0.009	-0.010	0.045	0.036	0.036
Area 20†	0.084	0.088	0.092	-0.014	-0.018	-0.020	0.070	0.070	0.072
Area 9†	0.261	0.332	0.290	0.045	0.043	0.047	0.306	0.375	0.337
Area 1	0.002	0.000	0.002	0.000	0.000	0.000	0.002	0.000	0.003
Area 2	0.004	0.007	0.007	0.001	0.002	0.000	0.005	0.009	0.007
Area 3	0.011	0.011	0.014	0.006	0.007	0.007	0.017	0.018	0.022
Area 4	0.021	0.022	0.025	0.006	0.004	0.011	0.027	0.026	0.358
Area 5	0.020	0.016	0.020	0.010	0.009	0.012	0.030	0.025	0.033
Area 6	0.026	0.026	0.029	0.009	0.007	0.012	0.035	0.033	0.042
Area 7	0.026	0.024	0.024	0.006	0.003	0.002	0.032	0.028	0.026
Area 11	0.103	0.094	0.086	0.001	0.006	0.012	0.104	0.100	0.098
Area 13	0.060	0.055	0.006	0.009	0.001	0.005	0.069	0.057	0.068
Area 14	0.058	0.066	0.048	0.009	0.018	0.017	0.068	0.084	0.065
Area 17	0.178	0.179	0.205	0.074	0.074	0.101	0.252	0.253	0.306
Area 18	0.047	0.041	0.033	-0.004	-0.002	-0.001	0.043	0.038	0.032
Area 19	0.088	0.086	0.073	-0.010	-0.005	-0.010	0.078	0.081	0.063
Area 21	0.073	0.066	0.066	-0.011	-0.002	-0.005	0.063	0.064	0.061
Area 22	0.050	0.042	0.042	0.016	0.011	0.012	0.066	0.053	0.054
Area 23	0.122	0.126	0.123	0.034	0.031	0.034	0.156	0.157	0.158
Total	1.621	1.615	1.596	0.081	0.084	0.116	1.702	1.698	1.711

Table 5.10: Theil's Inequality Index Decomposition by Quantile: 1989-1996

		Between		Within		Total	
		Montevideo	Uruguay	Montevideo	Uruguay	Montevideo	Uruguay
Quantile							
1	1989	-0.042	-0.037	0.041	0.035	-0.0008	-0.002
	1992	-0.041	-0.038	0.039	0.034	-0.001	-0.003
	1996	-0.035	-0.035	0.031	0.031	-0.004	-0.004
2	1989	-0.040	-0.044	0.056	0.057	0.015	0.013
	1992	-0.043	-0.044	0.059	0.055	0.015	0.011
	1996	-0.041	-0.043	0.050	0.051	0.009	0.008
3	1989	-0.038	-0.039	0.072	0.068	0.034	0.029
	1992	-0.036	-0.039	0.069	0.067	0.033	0.028
	1996	-0.038	-0.040	0.064	0.064	0.026	0.024
4	1989	-0.032	-0.033	0.086	0.080	0.054	0.047
	1992	-0.032	-0.032	0.085	0.079	0.053	0.047
	1996	-0.035	-0.032	0.080	0.071	0.045	0.039
5	1989	-0.021	-0.023	0.097	0.092	0..076	0.069
	1992	-0.020	-0.022	0.095	0.093	0.075	0.070
	1996	-0.025	-0.026	0.092	0.091	0.067	0.064
6	1989	-0.008	-0.011	0.113	0.109	0.104	0.097
	1992	-0.005	-0.009	0.108	0.110	0.102	0.100
	1996	-0.010	-0.014	0.106	0.108	0.096	0.093
7	1989	0.010	0.006	0.128	0.129	0.139	0.135
	1992	0.013	0.009	0.127	0.129	0.140	0.138
	1996	0.007	0.008	0.126	0.125	0.134	0.133
8	1989	0.035	0.038	0.162	0.155	0.198	0.193
	1992	0.043	0.045	0.150	0.152	0.194	0.198
	1996	0.045	0.042	0.151	0.153	0.197	0.195
9	1989	0.100	0.098	0.195	0.199	0.295	0.297
	1992	0.097	0.106	0.198	0.199	0.295	0.306
	1996	0.111	0.116	0.199	0.200	0.311	0.317
10	1989	0.383	0.457	0.381	0.450	0.765	0.907
	1992	0.384	0.437	0.392	0.415	0.777	0.853
	1996	0.445	0.476	0.381	0.410	0.826	0.886
Total	1989	0.355	0.417	1.345	1.385	1.702	1.802
	1992	0.365	0.414	1.333	1.341	1.698	1.755
	1996	0.423	0.452	1.287	1.312	1.711	1.765

Figure 1: A Schematic View of Polarisation

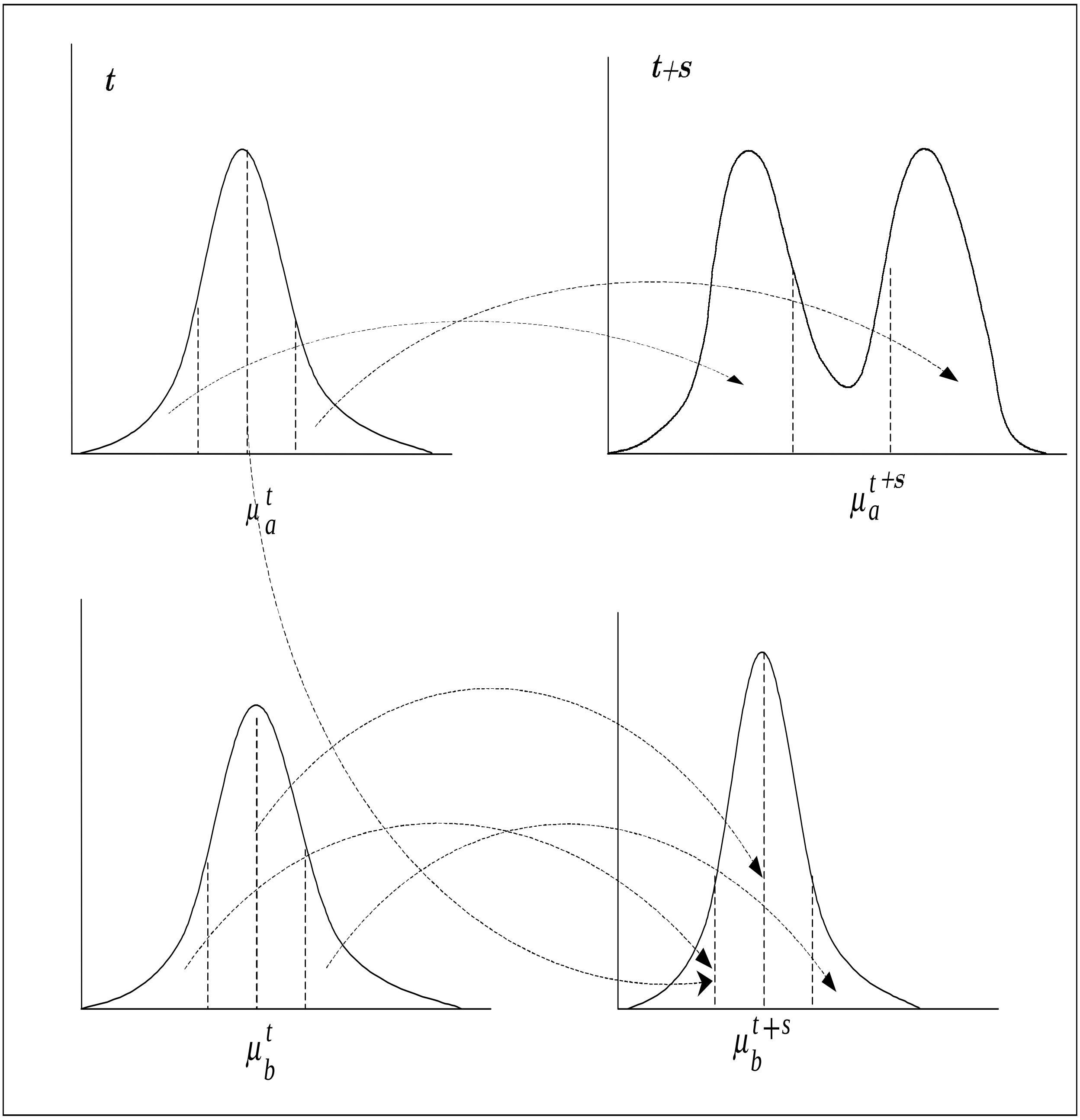

Figure 3: Population Shares across Areas and Deciles: Montevideo

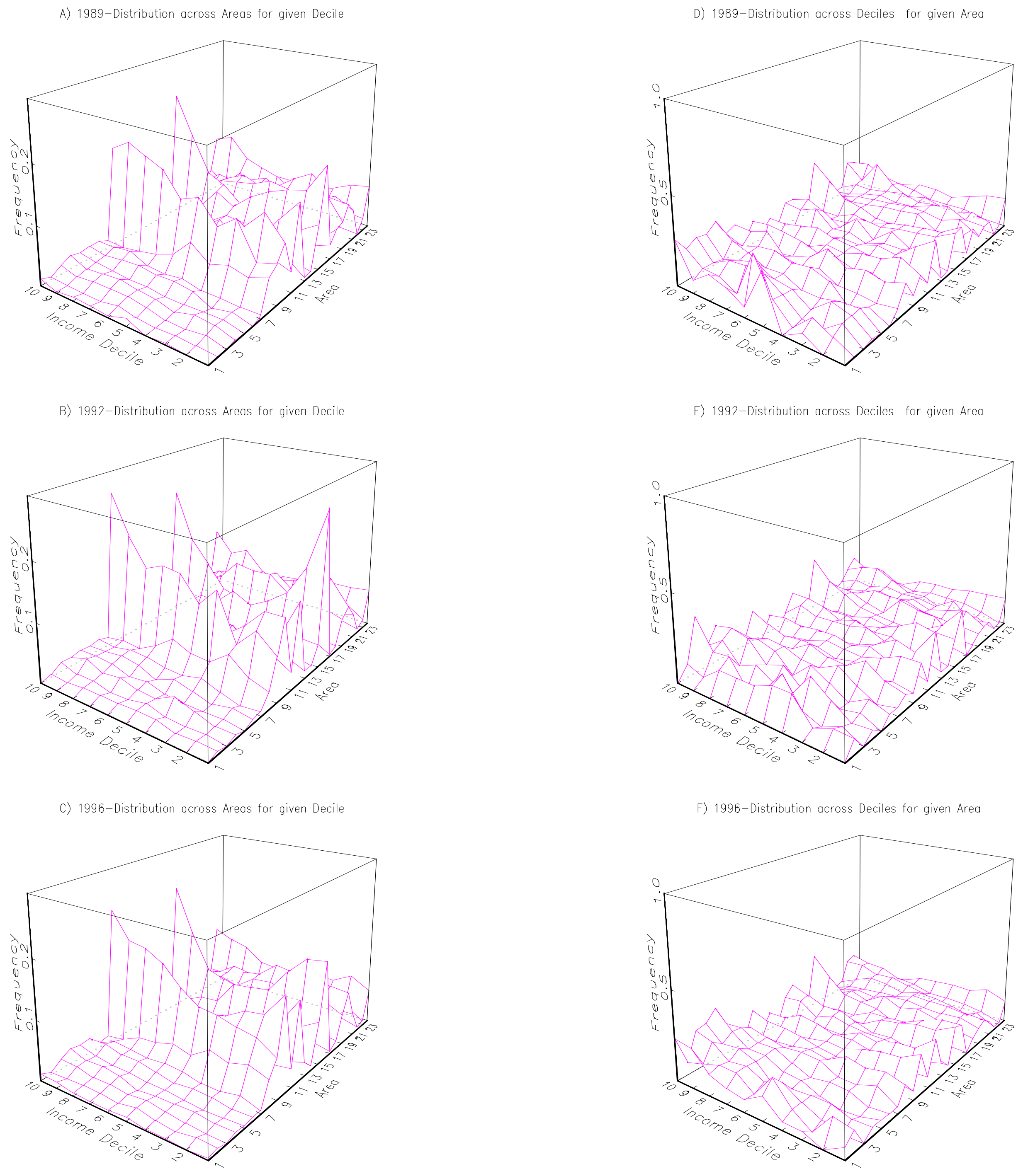

Figure 4: Density for Theil Inequality Index: Montevideo 1989-1996

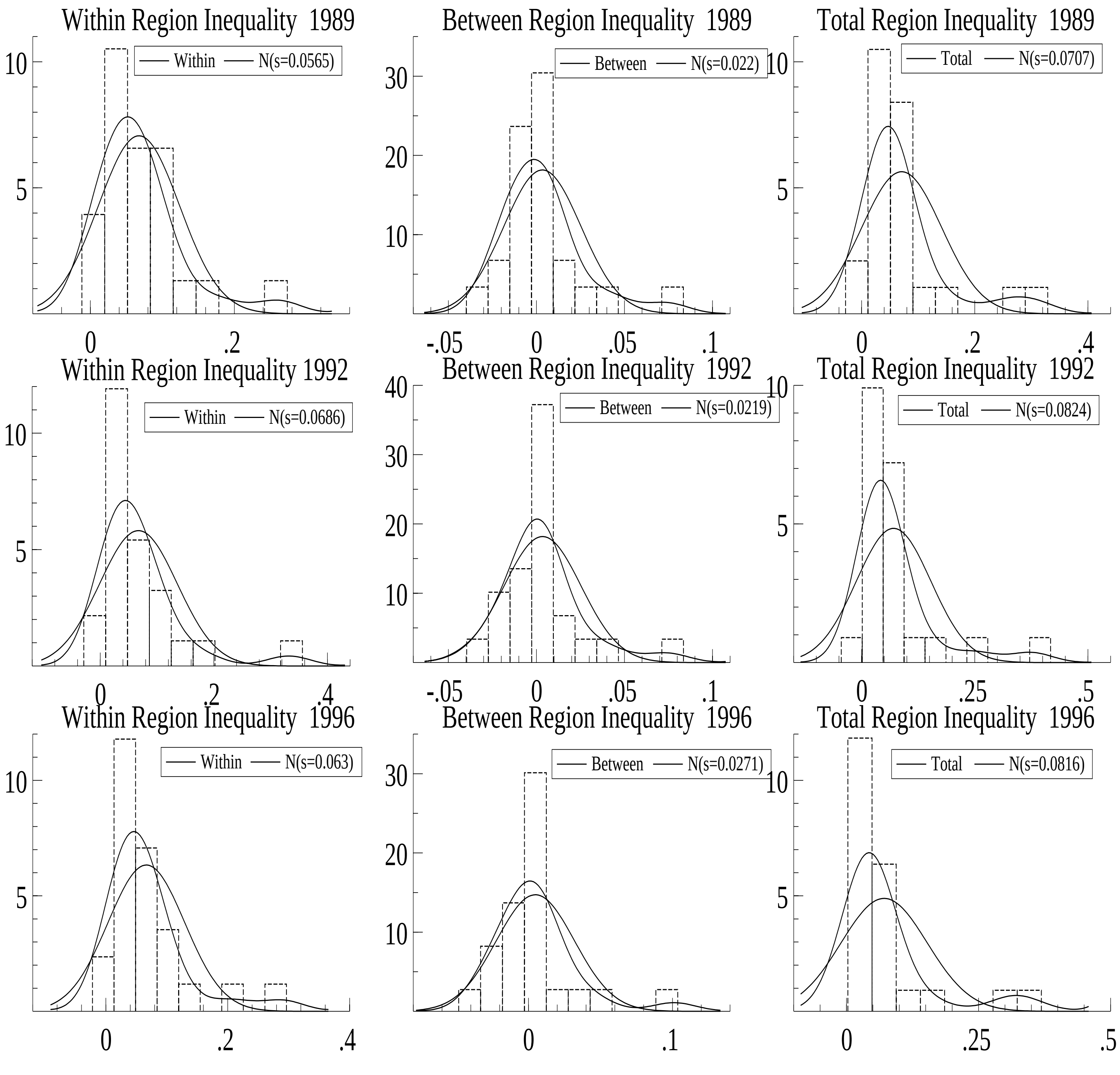

Figure 5: Density for Theil Inequality Index: Uruguay 1989-1996