THE RURAL PENALTY: WHY THOSE LIVING IN VILLAGES ARE POORER?

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Abstract:

This paper analyzes the effect on per capita income of the urban-rural gap. This is, how living in an urban, intermediate or rural area affects the income of the individuals in Spain. Using the CEQ fiscal analysis methodology, I examine data of the year 2020 from the Living Conditions Survey and the Household Budget Survey data. After constructing several measures of income, I estimate the effect by using a pooled OLS with fixed effects. Results show that after controlling for other personal and geographical determinants of income, living in a rural area has a negative effect of more than 1000€ per capita yearly for an average individual with the same characteristics than one living in a rural area. The gap is reduced to 600€ per capita when the individual living in an intermediate area as compared to one in an urban area.

1. INTRODUCTION

The study of economic inequality is the study of what factors determine the income of individuals with different characteristics. This area of research is attracting the attention of economics research in recent times. Recent studies have shown an increase in inequality (Piketty, 2014; Milanovic, 2012; Stiglitz, 2013), and have proposed some solutions to the problem (Atkinson, 2015; Milanovic, 2016; Blanchard & Rodrik, 2021). In the specific field of economic geography, there exists a whole area of studies researching on how geography affects different economic outcomes (Krugman, 1999; Henderson, et al., 2001).

More specifically in the area of economic geography, the urban-rural gap is an old topic in the economic geography literature (Dewey, 1960; Benet, 1963; Pahl, 1966), but it is becoming back in fashion as Rodriguez-Pose (2018) gave a new focus to the topic. This new focus that gets some element from electoral behaviour and political science, consists on linking the rural discontent, derived from the urban-rural gap in public investment or infrastructures, with the raise of populist vote and movements in these affected areas. In addition, the study poses if there are rural and economically depressed regions within a country that are considered from the public policy perspective as places that don't matter.

Traditional literature about the urban-rural gap, explained that urban environments were the ones that lead knowledge, innovation and economic growth (Duranton & Puga, 2004; Glaeser, 2011; Combes, et al., 2012). This stream of research was even supported by the view of International Organizations (World Bank, 2009; World Economic Forum, 2012). However, more recent research has pointed out that "there is no law that makes big cities always more dynamic. Gambling on large agglomerations as winning horses is not always a sure bet and is now becoming more perilous than ever" (Rodriguez-Pose, 2018, p.206). As a consequence, new research is showing the necessity to close the urban-rural gap, especially in what is concerned to inequality, poverty and unemployment.

Within this objective of reducing the urban-rural gap, the study of Spain is of particular interest as it is one of the European countries where population is more concentrated in urban areas and there are more rural depopulated areas (Gutierrez, et. al., 2020). As a consequence, the

risks derived from having a big urban-rural gap could be potentially more dangerous for Spain than for most of the other European countries. As shown in Figure 1, Spain suffers clearly an anomaly on this topic and studies like this could orientate public policy recommendations in order to approach the problem. Previous studies on the Spanish urban-rural gap have focused on variables as the use of land (Serra, et. al., 2014), landscape (Pallarès, et. al., 2014), mortality (Reher, 2001), height (Martínez-Carrión & Moreno-Lázaro, 2007), environmental variables and pollution (Arruti, et. al., 2012), medical variables (Maté-Jimenez et. al., 1994), fertility (Sven Reher & Irso-Napal, 2010), and migration (Collantes & Pinilla, 2011).

Figure 1. Inhabited Grid Cells in Europe (2011)

Source: (Gutierrez, et. al., 2020)

However, although the topic of inequality and poverty, and the topic of the urban-rural gap have been well studied in separated terms, very little is known about how the rural-urban gap impacts on the fiscal incidence on inequality and poverty. Some studies (Sicular, et. al., 2007; Young, 2013; Chen & Norgaard, 2016) have started to research this topic, but still it is not enough to have a sound knowledge about the phenomenon. Indeed, Bernard, et. al. (2019) proposed as the main directions for further research in the area the "impact of different welfare systems on rural poverty (and inequality), encompassing both the impacts of centralised welfare programmes and of locally specific welfare provision" (p.35).

Furthermore, there is a "growing interest in place specific factors of rural poverty (and inequality)" (Bernard, et. al., 2019), but national specific studies on rural poverty and inequality have traditionally focused in countries as United States (Wuthnow, 2018) and United Kingdom (Black, et. al., 2019), and almost no research has been done for Spain. Some studies have studied specific Spanish regions (Izcara-Palacios, 2007), or groups of countries that contain Spain (Valero, et. al., 2016), but not on Spain as a whole. My research could shed light on specific factors of the continental and Mediterranean contexts of Spain that are not contained in the studies for countries of Anglo-Saxon tradition as UK and US. As mentioned before, the

singular spatial distribution of the population in Spain justifies the interest on this study. Indeed, it is certainly important to approach rural poverty and inequality with more specific policies that could fit better into each context and be more cost-effective in reducing the urban-rural gap.

Moreover, this study does not aim to study with a historical perspective. The data used would be as closer to the present as possible, taking into account that statistical surveys may suffer a delay of one or two years in some cases. More specifically, the first paper would use data of the year 2020 and in the following papers the data would be actualized if it is available for the subsequent years. Leaving aside the complexity of analyzing a time-series trend for our variables, my study will rather focus on doing a point-in-time tax-by-tax and transfer-by-transfer analysis, disentangling every element of the fiscal system and looking to which parts of the fiscal system are more efficient in reducing poverty and inequality. As a consequence, the complexity of the study would be derived from managing different kinds of taxes and transfers each one with its particularities.

2. METHODOLOGY AND DATA

The CEQ fiscal analysis model

The model of the Commitment to Equity institute (CEQ) offers a rigorous and comprehensive tax and benefit analysis. In order to construct the database with the CEQ income concepts, original data from two sources has to be combined: A national income-based or consumption-based survey (in our case the ECV) and fiscal administrative information about the budget and the specific allocation to expenditures (in our case the EPF). In the case of this paper, the data used would be from the year 2020. The Living Conditions Survey (ECV) is an annual survey that contains data for around 13,000 households and 35,000 people in Spain. It is done by the Spanish National Statistical Institute (INE). It provides data to analyze the income distribution and social exclusion dimensions among others. The Household Budget Survey (EPF) provides annual information on the nature and destination of consumption expenses, as well as on a range of features relating to household living conditions. Approximately, 24,000 households are interviewed by the Spanish National Statistical Institute.
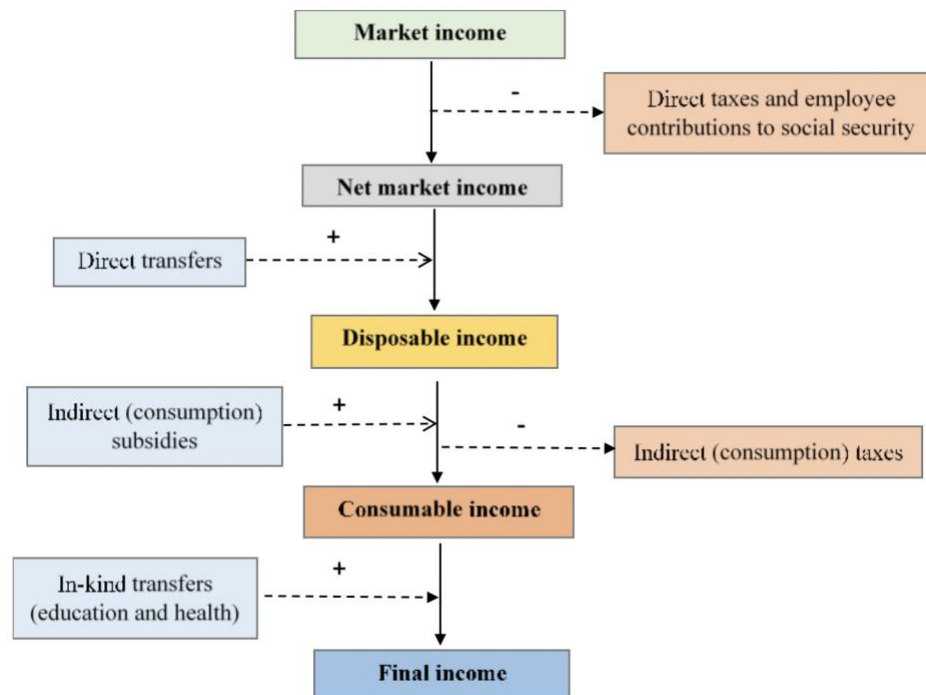
Definition of fiscal income concepts

Once the data of the surveys is combined and treated, the different income concepts are constructed. This income concepts are the key point of the method and they are summarized in Figure 2. The income concepts used as a base for the fiscal incidence analysis in this paper are: market income, disposable income, consumable income and final income.

Market income is the amount of money earned by an individual before paying taxes and receiving transfers. This income concept could be split into wages, income from capital, private transfers and own production. If to that income we add the direct cash and near cash transfers, and we substract the personal income taxes and social security contributions, what we have in the end is disposable income. Similarly, to go from disposable income to consumable income, what we need is to add the monetary value of indirect subsidies received (i.e. energy subsidies, food subsidies...), and substract the cost of indirect taxes (VAT, excise taxes...). Having

computed consumable income, the last step to arrive to final income is to substract the co-payments and user fees, and to add the monetary value of in-kind transfers in public education and health services. Final income is considered as the amount of money that an individual can finally spend. Depending on the market income earned and the fairness of the fiscal system, an individual could end up with a higher or lower final income compared to his market income.
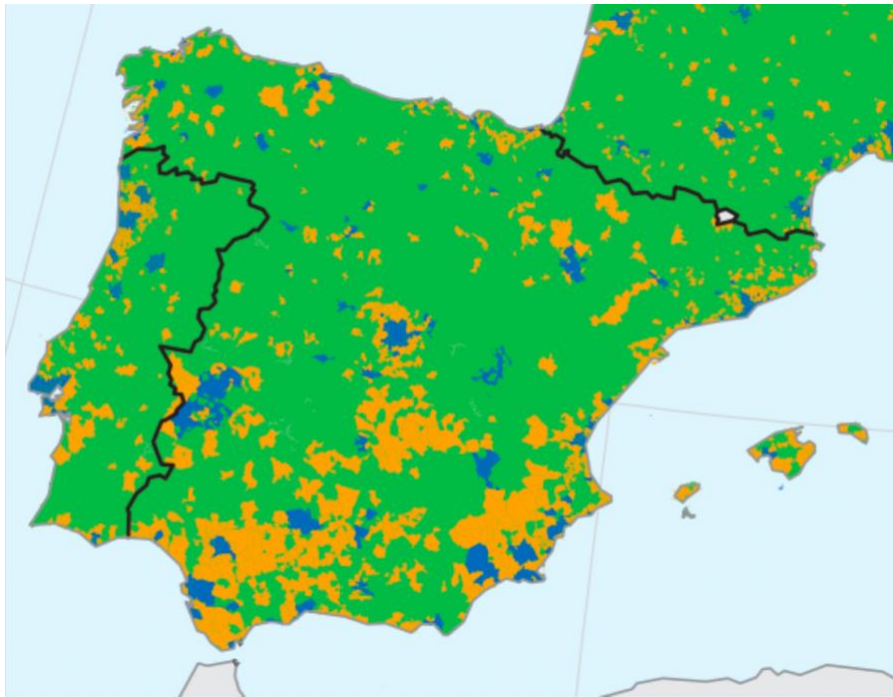
Figure 2

Source: (Lustig, 2018)

Defining urban and rural areas

The rural-urban differences are based on the indicator "degree of urbanization" that the EVC collects for all the households. At the same time, the indicator is based on the Local Administrative Units (LAU) developed by the EU statistical service Eurostat. The methodology followed for the construction of LAU is the division of a territory in 1 km2 grid cells. This indicator is divided in three categories, namely: densely populated areas or cities, intermediate density areas or towns and suburbs, and thinly populated areas or rural areas.

Cities correspond to areas with grid cells where at least 50% of the population lives in urban centres. Urban centers are defined as 1 km2 cells which are surrounded in all directions (up, down, left, right and the 4 diagonals) by grid cells that have more than 50.000 inhabitants and a density of at least 1500 inhabitants per km2. Towns and suburbs are areas in which the grid cells have at least 50% of the population living in urban clusters and less than 50% of the population living in urban centres. Urban clusters are defined as 1 km2 cells which are surrounded in all directions by grid cells that have at least a density of at least 300 inhabitants and more than 5.000 inhabitants per km2. Rural areas consist on areas with grid cells that have at least 50% of the population living in rural grid cells. This ones are 1 km2 cells outside of urban clusters.

Figure 3

Legend: Urban areas (blue); Medium areas (orange); Rural areas (green)
Source: European Union geographical data

3. SUMMARY STATISTICS

As we can observe in figure 4, we have 10,578 observations for rural areas, 9,138 for intermediate areas and 18,293 for urban areas. Individuals living in rural areas have on average a lower income at all the categories and individuals living in urban areas have on average a higher income at all categories. With respect to the standard deviation, it is higher in urban areas no matter which is the income category. Inequality (measured by the Gini coefficient) is higher in urban areas across all categories.

Market income is, according to figure 4, the most unequal income category taking into account the degree of urbanization. As the income is transformed into disposable income, inequality is reduced by 0.09 points for rural areas, by 0.07 for intermediate areas and by 0.08 for urban areas. When evolving to consumable income, inequality levels are maintained. Finally, when consumable income is transformed into final income, inequality is reduced by 0.09 points for the rural and intermediate areas and 0.07 points for the urban areas. We can declare that inequality follows similar patterns through the income concepts.
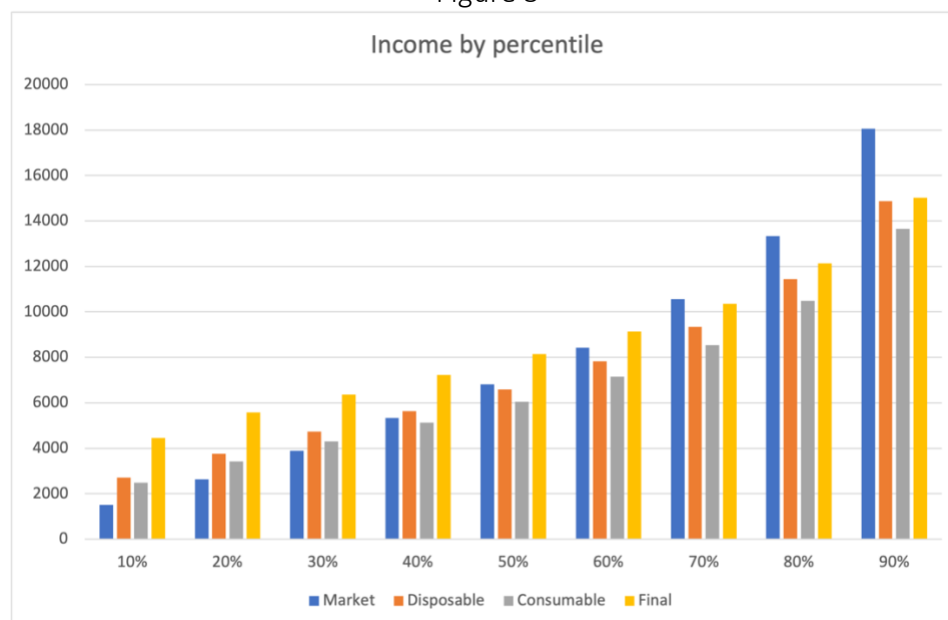
The percentage of individuals below the poverty line (60% of the median income) is of 17.08% in the urban areas, 17.50% for intermediate areas and 22.62% in the rural areas. This demonstrates a clear difference between areas, with a similar figure for urban and intermediate areas, but an increase of more than 5% from urban or intermediate to rural areas.

Figure 4

Type of income	Degree of urbanization	Obs.	Mean	Std. Dev.	Gini Coef.
Market income	Rural	10,578	7.020,80	6.506,13	0.43
	Intermediate	9.138	8.811,97	7.278,10	0.41
	Urban	18.293	9.736,86	8.759,44	0.44
Disposable income	Rural	10,578	6.948.05	4.739,59	0.34
	Intermediate	9.138	7.666,07	5.131.03	0.34
	Urban	18.293	8.865,31	6.307,06	0.36
Consumable income	Rural	10,578	6.356,53	4.343,83	0.34
	Intermediate	9.138	7.104,75	4.703,53	0.34
	Urban	18.293	8.114,60	5.527,63	0.36
Final income	Rural	10,578	8.179,84	4.113.44	0.25
	Intermediate	9.138	8.972,99	4.703,53	0.25
	Urban	18.293	9.861,08	5.527,63	0.29

As we can observe in Figure 5, all the elements of the fiscal system work in the process of redistributing income. For the individuals in the lowest percentiles, the rise in income that takes place from their market income to their final income, is operated mainly through direct transfers (change from market to disposable income) and through the monetized value of education and health (change from consumable to final income). For the individuals in the highest percentiles, the lowering of their income that takes place from their market income to their final income, is operated mainly through the direct taxes (change from market to disposable income) and through indirect taxes (change from disposable to consumable income). Last, the monetized value of education and health makes the final income to rise even in the richest percentiles.
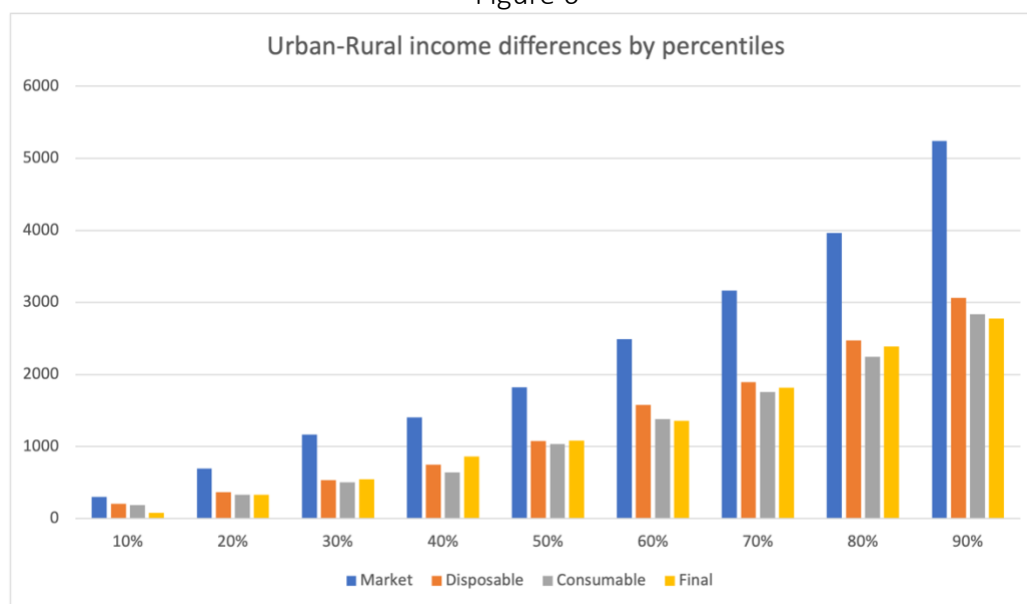
Figure 5

Source: Own elaboration

As explained previously, it is clear how the fiscal redistribution process helps to reduce interpersonal income inequality between individuals. To compare how the process of redistribution affects to the rural-urban gap (i.e. interterritorial inequality), I get the data of
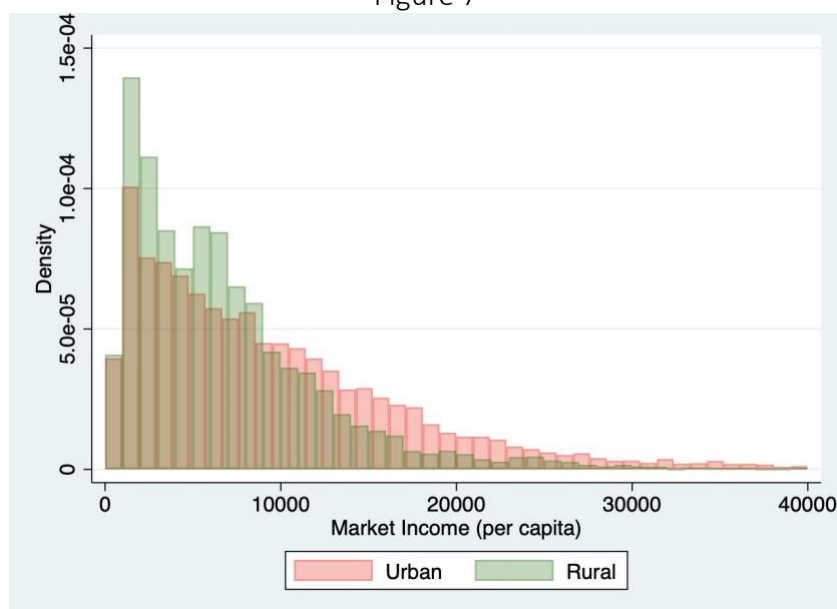
income percentiles differentiating by the geographical are (urban or rural) in which the individual lives. Figure 6 shows the difference between the urban and the rural areas for each income concept and percentile. The first observation that can be made is that the differences increase with the percentiles. However, it can be noticed how almost all the reduction that the urban-rural differences in income for all percentiles, happens due to the effect of direct taxes and transfers (in the change from market to disposable income). The contribution of the other fiscal tools is very modest.

Figure 6

Source: Own elaboration

Figure 7

Source: Own elaboration

In terms of the distribution of market income per capita, Figure 7 shows how the rural individuals are more concentrated below 10.000€, and the urban individuals are more concentrated between 10.000€ and 20.000€.

4. REGRESSION AND RESULTS

In order to examine what I have called the urban/rural effect on individual income, I use the Ordinary Least Squares (OLS) regression method with fixed effects by region (autonomus community) and sector of activity. As a further exercise for a better interpretation, I also run quantilic regressions. This type of regressions calculate a regression for each quantile of the dependent variable, instead of doing a general average one with all the data. This allows you to observe how the independent variables change their influence over the different quantiles. The equation would be as follows:

$$y_i = \alpha_i + \beta x_i + \delta u_i + \phi c_i + \epsilon_i$$

Where y_i is market income of individual i, α_i is the constant variable, x_i are some control variables as age, gender, level of schooling, employment status and household size, u_i is the variable that indicates if the individual lives in an urban, intermediate or rural area, c_i is the fixed effects term for region and sector of activity of individual i, and ε_i is the residual for individual i. The control variables are in line with the literature for the determinants of income per capita (Huber & Stephens, 2014).

Figure 8 shows the results of the OLS regression with fixed effects for autonomous community and sector of activity. In the analysis, variables "Intermediate area" and "Rural area" are calculated with respect to "Urban area", education variables with respect to "No education", household size variables with respect to "Household size = 1" and employment variables with respect to "Employee". In a general overview, we can observe that all the variables are significative except for those related to employment. From those variables that are significative, those related to education are the ones who have a higher effect on income per capita at all levels. This result is in line with the literature as explained in the first section of the paper.

What is interesting from the results is that after education, the variable which has a higher effect is the variable reflecting the urban-rural gap, even with a stronger effect than variables like age or gender. This is striking specially taking into account that our fixed effects for autonomous community get out of the our variable of interest part the regional component. This is, some autonomous communities are more urban and some others more rural. Applying fixed effects to the regression, the method ensures that the urban-rural gap on income exists even after subtracting the effect associated to each autonomous community. As demonstrated in (Tirado, Diez-Minguela, & Martinez-Galarraga, 2016), the effect of the autonomous community in Spain is significative for explaining economic outcomes, but our results indicate that the urban-rural effect exists and complements the mentioned regional variable.

Figure 8

	Market income	Disposable income	Consumable income	Final income
Age	-52.22***	52.56***	48.20***	35.78***
	(-18.80)	(25.45)	(25.44)	(19.40)
Gender	-327.1***	-351.4***	-321.6***	-227.8***
	(-3.77)	(-5.45)	(-5.44)	(-3.95)
Intermediate area	-418.7***	-686.2***	-630.2***	-615.5***
	(-4.10)	(-9.03)	(-9.04)	(-9.07)
Rural area	-1023.5***	-1056.0***	-969.4***	-1033.3***
	(-9.88)	(-13.71)	(-13.72)	(-15.01)
Primary education	239.8	1324.7***	1213.1***	1149.6***
	(1.30)	(9.66)	(9.64)	(9.38)
High school	1699.1***	2741.6***	2512.5***	2497.0***
	(9.78)	(21.22)	(21.20)	(21.63)
Professional education	1764.9	2448.9***	2243.6***	2255.0***
	(1.79)	(3.34)	(3.33)	(3.44)
University	4513.3***	5090.6***	4667.1***	4707.8***
	(24.28)	(36.84)	(36.81)	(38.14)
Household size = 2	-1716.1***	1184.0***	1077.8***	1105.2***
	(-12.39)	(11.50)	(11.41)	(12.02)
Household size = 3	-3188.1***	-1360.4***	-1255.8***	-763.0***
	(-21.86)	(-12.55)	(-12.62)	(-7.88)
Household size = 4	-4211.2***	-3137.1***	-2882.6***	-1925.2***
	(-27.78)	(-27.84)	(-27.88)	(-19.13)
Household size = 5	-5424.8***	-3384.1***	-3107.0***	-2058.7***
	(-26.72)	(-22.42)	(-22.43)	(-15.27)
Household size = 6	-6587.1***	-3660.4***	-3358.6***	-2381.1***
	(-20.57)	(-15.38)	(-15.38)	(-11.20)
Household size = 7	-7594.0***	-4542.8***	-4164.4***	-3284.4***
	(-12.85)	(-10.34)	(-10.33)	(-8.37)
Household size = 8	-6789.6***	-4003.1***	-3677.9***	-2944.9***
	(-7.48)	(-5.93)	(-5.94)	(-4.89)
Self-employed	-175.2	-161.0	-147.0	-48.15
	(-1.02)	(-1.27)	(-1.26)	(-0.42)
Family work	-3409.8	-5783.0	-5277.3	-4739.5
	(-0.49)	(-1.12)	(-1.12)	(-1.03)
Unemployed	-3859.6	-3527.9	-3208.6	-2656.9
	(-0.56)	(-0.68)	(-0.68)	(-0.58)
_cons	13981.4*	8217.8	7503.8	6952.5
	(2.01)	(1.59)	(1.58)	(1.51)
N	31210	31210	31210	31210

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Results in figure 8 show that for market, disposable and final income, living in a rural area affects the income of the individuals negatively by more than 1000€ per capita yearly, as compared to those individuals living in an urban area. For the case of intermediate areas, the effect is reduced to more than 600€ per capita yearly for the case of disposable, consumable and final income.

5. CONCLUSION

This paper shows that, in line with previous contributions of the literature, it exists an urban-rural gap for income per capita in Spain. This means that after taking into account the personal characteristics that affect income per capita (i.e. age, gender, level of education, employment status, sector of activity and region of residence), the fact that an individual lives in a urban, intermediate or rural area has a significant effect on the income per capita that the individual finally earns. Our OLS with fixed effects estimation shows that individuals of the same characteristics earn on average 1000€ per capita more if they live in an urban area as compared to a rural area. The difference is reduced to 600€ more for the urban individual as compared to one living in an intermediate area. This work has also observed that in order to close the urban-rural gap, the most effective tool are indirect taxes and transfers. As policy implications, this paper suggests that to reduce the urban-rural income gap, it is important to increase direct taxes and transfers. Other option would be to improve the functioning and creating a "rural positive discrimination" of indirect taxes and transfers, co-payments and the monetized value of education and health.

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