

The Public Finance Position of Immigrants in Europe: A Quantile Regression Approach *

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Abstract

We contrast the net fiscal position of immigrants versus natives using data from the European Survey on Living Conditions for 2007-2015. Using a quantile regression approach, we find that European and non-European migrants have a different fiscal position from natives only on the extreme tails of the NFP distribution. Non-EU migrants contribute even more than natives in the top quantile of the NFP, but they are more fiscally dependent than native citizens in the lowest quantile. These findings suggest that immigrants are not a public finance burden and do not increase public spending in the destination country. We also examine the relationship between migrants' fiscal position and the fiscal perception of natives versus migrants as measured in European Social Survey. We believe that by examining the effects of migrants on public spending, we can gain valuable insights into the economic implications of immigration and develop evidence-based migration policies, fostering integration.

Keywords: fiscal position, immigration, quantile regression, European countries

JEL codes: H53, I30, F22

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1 Introduction

This research contributes to the ongoing policy debates surrounding immigration by emphasizing the need for a nuanced understanding of the fiscal implications of migrants. An increasing body of literature studies immigration and its effects on the economy of the destination country. This interest is justified by the increasing incidence of foreign-born population on natives. A total of 3.9 million people migrated to one of the EU-27 Member States during 2018, whereas 2.6 million emigrants were reported to have left an EU-27 Member State.¹

The economics of migration focuses primarily on the impact of immigration on the labor market, such as its effects on wages, employment, and national savings (Card (2009), Ottaviano and Peri (2012), Arcangelis and Joxhe (2015)). However, the effects of immigration on government public finance have received relatively less attention despite being a prominent topic in political and public finance debates, such as the case of Brexit. This limited focus on the public finance impact of immigration can be attributed to the complexity of the analysis, data limitations, and challenges in implementing appropriate methodologies.

Previous studies have typically examined the fiscal effects of migrants within a single destination country, such as the UK (Dustmann and Frattini (2014)), Martinsen and Rotger (2017) and Agersnap et al. (2020) for Denmark, and Clarke and Skuterud (2013) for Canada. Prior cross-country studies are very few: notable exceptions are Boeri (2010) and OECD (2013). Boeri (2010) uses data from the European Survey on Living Conditions (EU-SILC) for the period 2004-2007 and finds that migrants are over-represented among beneficiaries of non-contributory transfers, and that they tend to receive more transfers than natives after accounting for their educational attainments and family characteristics. The OECD report finds that cross-country comparisons yield no significant differences between migrants and natives in fiscal terms. Both Boeri (2010) and the OECD (2013) use *average* comparisons of the fiscal positions of natives versus migrants. The general takeaway in this literature is that the *average* fiscal position of migrants is not very different from that of natives (OECD (2013)). This means that on average immigrants are contributors to the public finance of the destination country.

The purpose of our paper is to re-examine the net fiscal position (NFP) of immigrants in Europe, extending prior literature along several dimensions. Firstly, to the best of our knowledge, differently from any previous paper we use a quantile approach to detect differences in the fiscal position of migrants and natives. The quantile approach is particularly appropriate in this setting because, as it is widely recognized, immigrants tend to be located on the tails of the skill or income distribution, at least during the first few periods following their arrival. Secondly, our investigation includes a large number of destination countries in Europe, allowing not only a pooled analysis at the European level but also comparisons across different EU countries, Norway and the UK. Finally, this paper establishes a link between the fiscal position of immigrants and the fiscal perception of immigrants by native citizens thus revealing unexpected relationships.

We use the EU-SILC database for the years 2007-2015 to estimate the net fiscal position of migrants². We define an immigrant as a non-citizen in any given destination country. We are only able to break down the origin of migrants be-

¹See Eurostat 2018: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Migration_and_migrant_population_statistics.

²We stop our analysis on 2016 as the flows of refugees starting from the 2015 may create distorted and incomplete estimations, in particular for the public social transfers.

tween EU and non-EU migrants. The net fiscal position is defined as the difference between annual fiscal contributions paid in a year and the social benefits and transfers received in that same year. Social transfers include social assistance, housing benefits, sickness benefits, unemployment benefits, and education subsidies for groups at high risk of social exclusion. Fiscal contributions include the amount paid in income and wealth taxes, paid local fees, and finally pension contributions payments. We control for a series of individual characteristics including gender, age, marital status, employment status, months spent in unemployment, education, and health status. We also account for household observed characteristics like size, the degree of urbanization in the area of residence of the household, and a household poverty indicator.

Employing quantile regressions allows exploring non-linearities and different sensitivities of the determinants of NFP across different segments of the whole NFP distribution. As Borjas (1987) has shown the incentives and the costs to migrate may vary across age, gender and education levels. Both high-skill and low-skill migrants will populate hosting countries but they will be more concentrated on the tails of the distribution with respect to income or fiscal position. It is therefore salient to examine their fiscal positions using a quantile approach taking into account also a set of exogenous individual and household characteristics. We run quantile regressions for the 5th, 25th, 50th, 75th, and 95th quantiles. Our findings reveal distinct patterns at the extremes of the NFP distribution. Bottom-earners among EU-migrants (belonging to the $Q_{0.05}$ quantile) are not fiscally dependent in any of the 27 European countries. By contrast, bottom-earners among non-EU immigrants are budgetary dependent, getting €1,260 more than native Europeans. Importantly, and contrary to the populist rhetoric, top-earners in the non-EU migrant group (belonging to the top $Q_{0.95}$ quantile) pay €1,256 more than natives in the same quantile. These results are robust to a large number of heterogeneity controls. Overall, immigrants have a positive impact on public finance and do not contribute to public spending except for a very limited segment of the income distribution confined to the lowest $Q_{0.05}$ quantile.

After establishing differences in the NFP between migrants and natives and the corresponding consequences on public spending, we contrast the relationship between the calculated fiscal position of migrants with the fiscal perception by native citizens³. It is plausible to suppose that the fiscal perception on immigrants by natives may be mostly driven by the most deprived groups of migrants who may benefit more from social services, with the possible consequence of congesting these benefits for native citizens. To investigate this issue we analyze the gap between the fiscal position of migrants along different income quantiles and fiscal perception by natives. The latter is measured using data from the earliest available wave of the European Social Survey 2002, 5 to 15 years before the measure of the fiscal position data to mitigate selection issues. A representative sample of the EU native population answered the question of whether migrants contribute or take away their services from the destination country. Surprisingly, the link between the calculated fiscal position and the fiscal perception of the native citizens in European countries appear to be complex. In countries such as Denmark, Germany, Sweden, and Norway, among others, usually characterized by generous welfare systems and where natives show positive fiscal perceptions about migrants, both EU and non-EU migrants in $Q_{0.05}$ or $Q_{0.95}$ are not significantly different than natives. In other countries like Belgium and Netherlands where the perception about migrants is negative, non-EU migrants belonging to $Q_{0.95}$ actually pay much more taxes than native citizens.

³Concern about the economic impact of migrants is strictly related to the the feelings by native citizens about migrants: see for a survey Preston (2014).

Taken as whole, our findings suggest that migrants are not a public finance burden and a proper understanding of the fiscal effects of immigration allows for a more accurate and fair comparison of migrants with native citizens in terms of their public finance contribution. Our novel results are essential to inform the policy decision-making of the European Union as a whole and EU member states, ultimately allowing a proper design of immigration strategy and fiscal policy.

The paper is organized as follows. We continue in Section 1.1 with a review of the relevant prior literature. In Section 2 we provide an analysis of the fiscal position of migrants. Quantile regressions are introduced in Section 3. Section 4 is dedicated to the comparison of fiscal perceptions and net fiscal position. Finally, section 5 concludes.

1.1 Related literature

The literature on the fiscal position of migrants is relatively sparse. Most prior studies analyze specific countries such as the US and the UK, with a smaller number concentrating on other countries such as Germany, Denmark, Canada, Australia, and New Zealand.

For the US, research has shown that welfare dependency in cash transfers is less likely for immigrants household than for natives when essential personal characteristics are taken into account (Blau (1984)). Borjas and Trejo (1991) have documented that the probability of being a welfare user in the US increases with migration duration and with the more recent immigration inflows. Dustmann et al. (2010) and Dustmann and Frattini (2014) show that EU migrants in the UK have made substantial financial contributions even during deficit years. Other migrants have been net fiscal beneficiaries – a contrast that is even stronger for migrants from the A8 countries that joined the Union in 2004. A similar evaluation in Denmark also found robust and positive net contributions from EU migrants (Martinsen and Rotger (2017)).

Further, a static analysis of migration to Sweden from Bulgaria and Romania by Ruist (2014) found a net positive contribution of about €3,000 per person. Other studies show a more considerable welfare dependency among immigrants than natives, for example in Sweden and Finland, but this dependency decreases with their length of stay, Hansen and Lofstrom (2003) and Sarvimaki (2011). Bratsberg et al. (2010) and Bratsberg et al. (2014) for Norway find that the social insurance dependency of immigrants declines over time. Cohen and Razin (2008) and Razin et al. (2011) argue that greater welfare generosity in a country may increase less-skilled immigrant flows when there are no policy controls, and argue that the latter can be a solution to welfare-driven immigration flows.

Razin and Wahba (2015) revisit and test the hypothesis of social magnet in international migration by using the mobility restrictions in Europe in shaping the effect of the welfare state on migration. Their study investigates the effects of the generosity of the welfare state in attracting international migrants, by analyzing the skill composition of migration patterns and highlighting the difference between skilled and unskilled migration rates. They find that under the free-migration regime there is strong support for the magnet hypothesis. More recently, Agersnap et al. (2020) establish a causal link between the welfare generosity on international migration using reforms of immigrant welfare benefits in Denmark. De Giorgi and Pellizzari (2009), using data from the European Community Household Panel (ECHP) for the years 1994-2001, show that welfare generosity is less important than the unemployment rate or wage levels. By contrast Boeri (2010), using data from EU-SILC for 2004-2007, finds that immigrants in Nordic countries are less likely to be net fiscal contributors whereas in countries like Austria or Germany the opposite is true. On the other hand, Pedersen et al.

(2008) and Giulietti (2013) analyzing inter-country migration flows in panels of EU and OECD countries, suggest no firm evidence of welfare benefits for migrants. There is furthermore growing public concern regarding the (ab)use of the welfare system by foreigners, which has led to cut-off welfare policies for non-natives in some European countries (Boeri (2010)). We complement the corresponding literature by highlighting the heterogeneity of migrants' fiscal position along different NFP quantiles. In addition, our investigation includes a large number of destination countries in Europe, allowing not only for a pooled analysis at the European level but also for comparisons across countries.

Our paper is also related to the literature on population diversity and how welfare-state considerations may affect individual perceptions about migrants. Dustmann and Preston (2007) analyze attitudes towards immigrants in Great Britain using waves of the British Social Attitudes Survey and show that racist feelings of the natives have the strongest impact on people's opinion about immigration. In another paper, Dustmann and Preston (2004) using data from the (2002-2003) wave of the European Social Survey find that fears about public finance have the largest impact on immigration attitudes of natives. Hanson et al. (2007) investigate the impact of both public finance and labor market variables on individual preferences over globalization like international migration or the trade in goods and services. The authors conclude that welfare-state considerations of the US natives are crucial for understanding the individual attitudes towards globalization. A recent branch of the literature investigates welfare state policies and the impact on the natives preferences for redistribution. Hanson et al. (2007) find evidence that more immigration flows tend to lower support for redistribution in most of the European countries. Alesina et al. (2022), and Alesina et al. (2021) show that respondents may show lower support for redistribution when the share of immigrants in their residence region is higher, and this negative association is mostly driven by regions where the welfare states are large. Instead, Facchini and Mayda (2012) analyze welfare-state determinants of individual attitudes towards immigrants, showing that in countries where natives are on average more skilled than immigrants, the individual income is negatively correlated with pro-immigration preferences. In opposite to this, individual skills are positively correlated with pro-immigration preferences or voting choices (Moriconi et al. (2022)).

Our paper draws attention to the link between the fiscal perceptions of native EU citizens and the fiscal position of migrants, showing that such a link can be surprising. We compare our calculated fiscal position of immigrants and natives with the attitudes of natives versus immigration using data from the European Social Survey. Our results provide evidence that the negative perception of natives related to the fiscal position of immigrants is only justifiable for the lowest quantile fiscal position. In countries where immigrants are fiscal dependent (and countries have more generous welfare regimes) natives have also positive perception of the fiscal position of immigrants, whereas in countries where migrants are net contributors, the natives perceive them as fiscally dependent. This inverse correlation raises the issue that other channels (like media or some political narrative) may have an important impact on shaping natives perception related to the immigration issues.

2 Net fiscal position of migrants in Europe

In this section we detail how we measure the fiscal position of immigrants in European countries. We start by describing the data source and then we move on to a more precise definition of our main dependent variable, i.e. the net fiscal position, in Section 2.2.

2.1 EU-SILC Database

The EU-SILC database, launched in 2003, is a crucial resource for analyzing the fiscal position of immigrants in Europe. It is a comprehensive micro-level dataset that covers all 27 member states of the European Union. EU-SILC provides standardized annual surveys that gather information on various socio-economic aspects, such as individual and family backgrounds, housing conditions, income, and more. It offers detailed data on taxes paid, social benefits received, and different sources of income for individuals and their households. While the information on the native population in EU-SILC has a longitudinal dimension, the same cannot be said for non-EU migrants. Consequently, we are restricted to utilizing the cross-sectional version of the survey for the years 2007-2015.

Moreover, the data files provided by EUROSTAT do not allow for the identification of individuals' countries of birth. We can only determine if an individual is a native, a citizen of another EU country, or a non-EU citizen. Therefore, we can only differentiate migrants based on whether they are EU citizens or not. Hence, our analysis will focus on exploring the net fiscal position of migrants relative to native citizens, who consistently serve as the reference category. For a more comprehensive understanding of the database, please refer to Appendix A.1.

The sample size consists of 4,493 EU migrants and 6,821 non-EU migrants. The sample of native citizens, which serves as the reference group in all our estimations, comprises 128,114 individuals. Thus, we have around 9% of the sample formed by non-natives and 91% the rest is being represented by the natives of all the European countries considered.

2.2 Summary Statistics

Table 1 presents summary statistics for our main variables. We classify the data based on three categories of interest: native citizens, EU migrants and non-EU migrants. Most of the household characteristics are quite homogeneous across the three groups, except for the poverty indicator that appears to be slightly larger for Non-EU migrants.

At the individual level, on average immigrants are younger than natives, whilst the gender composition is quite similar across the three groups. Natives show the lowest percentage of married individuals whereas non-EU migrants exhibit the highest number of married couples. Non-EU migrants spend more months in unemployment than EU migrants and natives. As far as education is concerned, a large share of EU-migrants (20%) have only primary education, whereas 13% of natives and 10% of Non-EU migrants do so. A large percentage of natives possesses upper secondary education (43%). Finally, more migrants exhibit tertiary schooling than natives. Regarding self-employment and health status, the distribution of migrants at the European level does not differ from that of the native citizens.

2.3 Net Fiscal Position

We have conducted calculations to determine the net fiscal position for all individuals in the EU-SILC database, covering the period from 2007 to 2015⁴. This particular variable is defined as the difference between the total taxes paid each year and the social transfers received during that same year. Specifically, the calculation includes income taxes, wealth taxes, net tax transfers or repayments, and social security contributions, as outlined by EU-SILC methods. The second component of the NFP comprises the total social transfers encompassing social assistance, housing benefits, sickness benefits, unemployment benefits, and education subsidies provided to groups facing a high risk of social exclusion.⁵

Table 1: Summary Statistics. EU-SILC 2007-2015

	Natives		EU-Migrants		Non-EU-Migrants	
	Mean	SD	Mean	SD	Mean	SD
Individual						
Age	41.29	22.57	40.39	22.64	40.89	22.49
Male%	0.48	0.50	0.49	0.50	0.48	0.50
Marital Status	0.61	0.49	0.64	0.48	0.66	0.47
Unemployed %	0.09	0.28	0.11	0.31	0.14	0.35
No Qualification	0.01	0.90	0.01	0.09	0.02	0.12
Primary %	0.13	0.38	0.20	0.40	0.10	0.30
Lower Secondary%	0.17	0.41	0.14	0.34	0.20	0.40
Upper Secondary%	0.43	0.49	0.33	0.47	0.37	0.48
Post-Secondary%	0.04	0.17	0.03	0.17	0.04	0.18
Tertiary%	0.21	0.41	0.30	0.46	0.26	0.44
Health (Very Good) %	0.19	0.39	0.28	0.45	0.20	0.40
Health (Good) %	0.45	0.50	0.44	0.50	0.40	0.49
Health (Fair) %	0.25	0.43	0.18	0.38	0.27	0.44
Health (Bad) %	0.09	0.29	0.09	0.28	0.10	0.30
Health (Very Bad) %	0.02	0.15	0.02	0.13	0.03	0.16
Household						
Household Size	2.67	1.46	2.60	1.40	2.67	1.49
Household Degree of Urbanisation	1.98	0.89	1.98	0.87	1.96	0.88
Household Poverty Indicator	0.19	0.39	0.17	0.38	0.21	0.41
<i>N</i>	128114		4493		6821	

The table reports summary statistics (number of observations, mean, standard deviation) for the main variables used in the empirical analysis.

In this study, we conduct an accounting calculation for each household in the panel by subtracting the annual benefits received from the total taxes paid. To ensure consistency and comparability across countries and over time, we harmonize all monetary values by adjusting them with inflation weights and purchasing power parity, following the guidelines provided in Mack et al. (2020). This harmonization process allows us to make meaningful comparisons while accounting for inflation and the varying currencies used by countries which do not utilize the euro.⁶

In Table 2 we present summary statistics of the net financial position for natives, EU immigrants, and non-EU migrants, pooling data from all European countries. On average, all three categories exhibit a positive fiscal position.

⁴Refer to Appendix 10 for further details.

⁵Possible in-kind transfers provided by local governments (Figari and Paulus (2015)) are not included, as not available.

⁶Note that all monetary figures in our analysis are expressed in euros for uniformity and clarity.

However, native citizens contribute €1,286 to EU tax revenues, which is lower than the contributions made by migrants (€1,315 for EU migrants and €1,379 for non-EU migrants). In Table 3, we bring the mean fiscal position of natives and migrants for each country. In almost all cases, migrants are fiscal contributors. For instance, consider Italy, France and Germany, three large destination countries in Europe. Native citizens contribute €725 in Italy, €1,718 in France, and €1,276 in Germany; non-EU migrants contribute €344 in Italy, €1,074 in France, and €703 in Germany; finally, EU migrants contribute €833 in Italy, €1,458 in France and €3,291 in Germany. It is important to note that this table reports the NFP of migrants and natives without considering individual characteristics or distributional features of each group. These raw numbers display similar means and standard deviations.

Table 2: Raw average annual NFP by region of birth

	Mean	SD	Min	Max	No of Obs
NFP Natives	1286,078	10385.85	-237004	662988.6	128114
NFP EU Migrants	1315.593	11500.59	-78642.13	507783.2	4,493
NFP Non-EU Migrants	1379.182	9435.977	-115000.5	114732.7	6821

The table reports summary statistics (number of observations, mean, standard deviation, minimum and maximum) for the NFP of migrants and natives used in the empirical analysis. All values are deflated using 2007 as the reference year.

A more accurate assessment of the size and direction of the fiscal position can be obtained by incorporating controls for various exogenous individual and household characteristics, as well as country fixed effects. In the calculations presented in Table 4, we include individual characteristics such as gender, age, marital status, employment status, duration of unemployment, education level, and health status indicators.

Additionally, we consider household characteristics such as size, degree of urbanization, and a general poverty indicator for the family. For a comprehensive list of all the controls used please refer to Table 1. Importantly, we include year and country dummies to account for time effects and for any time-invariant characteristics specific to each country.⁷ In the last column, we report a winsored specification where 1% of each tail of the distribution of NFP is trimmed to mitigate any issues from outliers.⁸ When these controls are incorporated, the net fiscal position of both types of migrants, compared to natives, is positive but statistically insignificant. This means that, on average, migrants do not significantly differ from natives in terms of their fiscal position.⁹ This finding means that on average migrants are not a burden for the public spending in the destination country similarly to the natives (the average contribution is the positive constant in each column in the Table).

Undoubtedly, the net financial position variable encompasses various dimensions of heterogeneity that are not captured in the results presented in Table 4. Specifically, the NFP combines two main components: total taxes paid and total social transfers, both of which consist of multiple elements. Therefore, it remains unclear whether migrants and natives

⁷We also conducted estimations with regional fixed effects, and the results remained unchanged. All the estimations are available upon request.

⁸For a reference see Yale and Forsythe (1976).

⁹We did not control for the stock of migrants in these estimations, as it is correlated with the dummies used to identify both groups of migrants.

Table 3: Non-parametric estimation for the fiscal distribution between natives and migrants

Country	(1) Native NFP	(2) EU Migrants NFP	(3) Non-EU Migrants NFP
Austria	1510	975	2210
Belgium	1560	1363	2299
Bulgaria	906	145	851
Czech Republik	1151	950	1314
Germany	1276	3291	703
Denmark	1980	450	1641
Estonia	1125	918	1631
Spain	358	832	-306
Finland	1749	1471	1587
France	1718	1458	1074
United Kingdom	1729	1497	996
Hungary	1167	1132	835
Greece	1503	352	2533
Ireland	2188	2245	1270
Italy	725	833	344
Latvia	1238	411	1272
Lithuania	1036	1009	833
Luxembourg	1749	2809	866
Netherlands	1793	1353	2366
Norway	2230	-168	1900
Poland	752	808	621
Portugal	1129	405	1201
Romania	866	995	679
Sweden	2892	1821	1346
Slovenia	641	0	834
Slovakia	899	576	744

All values are deflated using 2007 as the reference year. In each model, the mean value of the NFP is calculated. All values are expressed in euros.

Table 4: Average NFP

VARIABLES	(1) NFP	(2) NFP	(3) NFP	(4) NFP winsored
EU Migrants	93.10 (167.5)	118.2 (168.8)	58.96 (169.3)	-1.564 (101.5)
Non-EU Migrants	29.51 (117.9)	90.90 (116.7)	96.17 (116.6)	77.88 (92.25)
Constant	1,286*** (29.02)	1,928*** (367.9)	1,921*** (395.7)	1,357*** (229.7)
Observations	139,428	139,428	139,428	139,428
R-squared	0.000	0.016	0.020	0.037
Ind. and HH. Controls	No	Yes	Yes	Yes
Country FE	No	No	Yes	Yes
Time FE	No	No	Yes	Yes

Robust standard errors in parentheses. All values are deflated using 2007 as the reference year. OLS estimation method is used in all Columns. In the specification (4), 1 per cent at each tail of the distribution of the NFP is winsored. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Social Transfers Allowances and Tax payments

VARIABLES	(1) House	(2) Cash	(3) Child	(4) Wealth tax	(5) Income tax
EU Migrant	-0.611 (6.48)	84.84*** (19.66)	72.49** (31.14)	-5.700 (6.538)	83.55 (156.9)
Non-EU Migrant	13.54** (6.416)	6.591 (11.04)	-12.46 (12.59)	1300 (6891)	189* (99.46)
Constant	122.0*** (19.36)	195.1*** (41.21)	-250.8*** (59.72)	67.36** (22.35)	2770*** (366.5)
Observations	139,417	139,417	139,417	139,417	139,417
R-squared	0.005	0.003	0.081	0.005	0.047
Ind. and HH. Controls	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses. All values are deflated using 2007 as the reference year. OLS estimation method is used in all Columns. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

differ or are similar in terms of taxes paid, social transfers, or both. To address this issue, we conduct additional estimations that separate the two components as well as the different items that constitute the social transfer and tax payment variables pooling all the European Countries. We run separate estimations for household allowances, cash transfers, child allowances, and income and wealth taxes. The results are displayed in Table 5. These findings provide valuable insights and relate to the existing literature on the hypothesis of welfare magnets (Razin and Wahba (2015)). This literature suggests that countries with more generous welfare systems attract a relatively higher number of unskilled immigrants, as the generosity of a country's welfare state may act as a magnet particularly for unskilled migrants. Interestingly, when analyzing the data at the European level, we find that EU migrants benefit more than natives from a Cash and Child transfer (column 2 and 3), whereas non-EU migrants benefit more than natives in terms of house transfers (first column in Table 5). Regarding wealth taxes, the results show that no migrant group has a different position compared to natives. However, non-EU migrants contribute a positive net income tax compared to natives.

We delve deeper into several sources of heterogeneity to better understand any potential differences in the net financial position between natives and migrants. We specifically examine migrants and natives based on the following dimensions of heterogeneity: (i) household size, distinguishing between larger households with more than four members ($N > 4$) and smaller households ($N \leq 4$); (ii) health status, comparing individuals in good health with those in bad health; (iii) age, distinguishing between younger and older individuals, based on the sample average age¹⁰; and finally, (iv) educational attainment, categorizing individuals with or without a college degree. These dimensions of heterogeneity influence the need for different levels of social transfers and tax payments, ultimately impacting the contribution of migrants to public finances in the country of destination.

The results, as shown in Table 6, reveal interesting insights. For non-EU migrants, the dimension of heterogeneity that significantly impact the NFP is the household size, where a non-EU migrant living in a larger household ($N > 4$)

¹⁰A large literature has focused on the relationship between age and tax system. See for instance Conway and Rork (2008), inter alia.

pays around 791 Euros more in taxes than a native in a comparable family situation. Similarly, a non-EU migrant with a college degree contributes 480 euro more than a native with the same education level. For EU migrants, the only significant dimension of heterogeneity that affects the NFP is health status. EU migrants in bad health exhibit a higher fiscal dependency compared to natives with the same health condition, with a difference of approximately 898 euros. Regarding age, there is no statistically significant difference in the average NFP between young natives and young migrants. This finding is interesting because age can serve as a proxy for the migrants' date of arrival, which is not directly collected in the EU-SILC dataset. Overall, these findings highlight the importance of considering various dimensions of heterogeneity in understanding the differences in the NFP between natives and migrants.

Table 6: Heterogeneity: Average NFP of Individuals along different dimensions

VARIABLES	(1) N > 4	(2) N ≤ 4	(3) Healthy	(4) Bad Health	(5) Age < 40	(6) Age ≥ 40	(7) No College	(8) College
EU Migrant	-50.73 (516.6)	50.22 (151.7)	-898.4*** (286.9)	141.1 (158.9)	61.96 (150.4)	-2.198 (252.4)	-31.29 (121.0)	185.8 (369.1)
Non-EU Migrant	790.9** (393.7)	5.716 (106.6)	399.9 (339.3)	46.78 (108.5)	62.66 (145.3)	114.5 (148.8)	-68.10 (122.0)	480.1** (197.7)
Constant	7,155*** (1,358)	1,590*** (402.7)	484.5 (776.9)	2,746*** (506.3)	1,365** (595.7)	2,091*** (548.9)	1,399*** (378.7)	1,371* (819.1)
Observations	14,395	125,033	15,331	124,097	68,051	71,377	101,852	37,576
R-squared	0.041	0.018	0.018	0.020	0.019	0.020	0.019	0.020
Ind. and H. Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses. OLS estimation method is used in all Columns. In all estimations, the dependent variable is the NFP. All values are deflated using 2007 as the reference year. *** p<0.01, ** p<0.05, * p<0.1

In summary, our analysis confirms that, on average, migrants and natives have a similar fiscal position, aligning with previous findings in the literature (OECD, 2013). However, it is important to note that social transfers and taxes paid are closely tied to income levels. Therefore, we anticipate that individuals in different income quantiles would exhibit distinct fiscal positions. To gain a clearer understanding of whether and when migrants' positions differ from those of natives, it is crucial to explore the entire fiscal distribution. By examining the fiscal position across various income groups, we can obtain a more comprehensive picture of the similarities and differences between migrants and natives.

3 A quantile approach to fiscal position

A critical aspect of understanding the net fiscal contribution of migrants is to recognize its close association with the income of migrant households and other economic, social, and demographic factors. In this perspective, it is crucial to examine whether the net contribution varies based on these factors and, specifically, whether there are significant non-linear relationships. Vulnerable groups are often located at the extremes of the statistical distribution of these variables, rather than in the middle. This is particularly relevant for the top right-hand tail of the distribution, where the largest

fiscal contributions are concentrated, as well as for the bottom left-hand tail, where families benefit the most from fiscal transfers.

Quantile regression is a powerful statistical tool that allows us to explore non-linearities and sign reversals in the relationship between a set of predictors and the dependent variable (refer to, e.g., Fattouh et al. (2005)). Its main advantage over linear regression methods is that quantile regression can examine the entire distribution of the dependent variable given a set of explanatory variables. While linear regression methods primarily focus on the average response of the dependent variable to the predictors, quantile regression can uncover different responses of the dependent variable across different sections of the distribution. This is particularly valuable for identifying variations on the relationship for vulnerable groups situated in the tails of the distribution, which may exhibit different sensitivities to the relevant explanatory factors compared to households in the middle of the distribution.

Figure 1: Distribution of the NFP over the quantiles

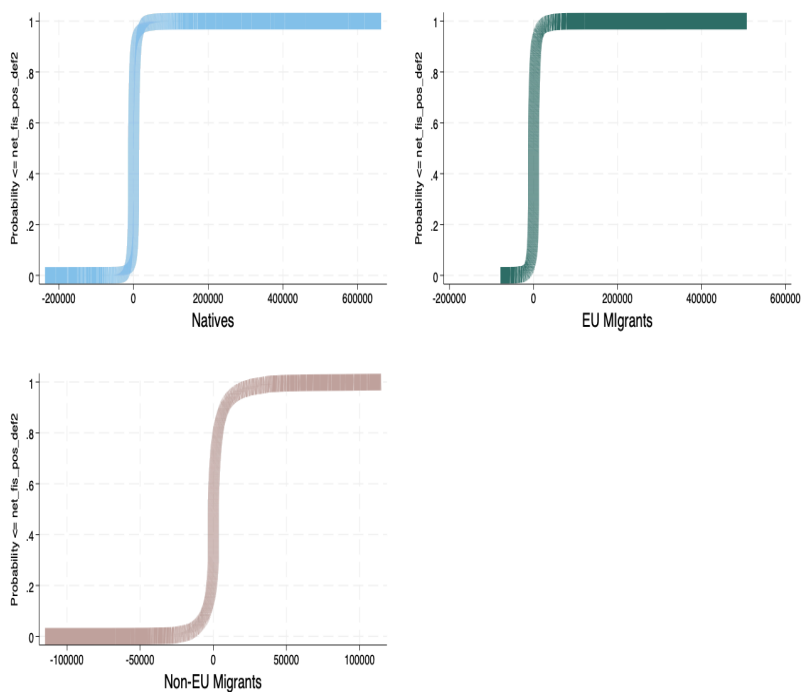


Figure 1 shows the distribution of NFP for both natives and migrants.¹¹ The three samples have a non-normal distribution and it is apparent that the tails of the distribution display a markedly different behaviour from the central quantiles. This suggests that it would be important to use a statistical methodology which allows for heterogeneity in the responses from the households at the extremes of the distribution. We also perform non-parametric tests to assess whether the fiscal distribution of natives and migrants is significantly different across countries (see Appendix A.4). The

¹¹The extreme negative values are driven by anticipated old age benefits and survivors' benefits.

fiscal distribution is positively skewed in most countries (the only exceptions are Denmark for the natives and Norway for migrants, which exhibit negative skewness). The overall fiscal distribution is usually not significantly different across countries, with the exceptions of Germany, Denmark, Spain, Portugal, Sweden, Slovenia, and (marginally) Poland. This is an interesting result, because it shows that in the majority of countries the overall fiscal profile is relatively similar for natives and for migrants.

3.1 Main Quantile Specification

Under the assumption that the θ -quantile of the conditional distribution of y_{it} is linear in x_{it} , we can estimate a quantile regression model of the NFP as follows:

$$\text{Quant}_{\theta}(Y_{it} | x_{it}) = \alpha_{\theta} + x'_{it}\beta_{\theta} + \gamma_t + \delta_i + u_{\theta it} \quad (1)$$

with:

$$\text{Quant}_{\theta}(u_{\theta it} | x_{it}) = 0 \quad (2)$$

where $\text{Quant}_{\theta}(Y_{it} | x_{it})$ is the θ -conditional quantile of y_{it} on the regressor vector x_{it} ; α_{θ} , β_{θ} are the unknown vectors of parameters to be estimated for different values of θ along the distribution of the NFP; γ_t and δ_i are respectively wave and country fixed effects. $u_{\theta it}$ is the error term which is assumed to have a continuously differentiable c.d.f with the conditional expectation over each quantile equal to zero. By varying the value of θ , we are able to track the entire distribution of y conditional on x .

Equation 1 is jointly estimated for the 5th, 25th, 50th, 75th and 95th percentiles of the NFP distribution, both for migrants from within the EU and for migrants from outside the EU. The same vector of explanatory variables is included as conditioning variables for each of these quantiles. The estimations are run on the entire population of migrants and natives in Europe. The estimation results are presented in Table 7. All specification include individual and household characteristics, as well as country fixed effects.¹² The first column displays the results for the OLS regression where, as already shown in Table 4, migrants and natives are no different. The quantile regressions, by contrast, offer a much more detailed breakdown of the results. The average NFP for each quantile is measured by the constant coefficient, which is increasing over the distribution because quantile regression sorts on average NFP. The average NFP for the bottom-earners among non-EU migrants is -€1,260, however, the average NFP for the top-earners is positive and equal to about €1,256 for the non-EU migrants. They generate a positive contribution in the destination country in excess of the contribution of native top-earners.

Interestingly, some heterogeneity is observed between EU and non-EU migrants. Bottom earners among EU migrants generate a positive contribution, even exceeding that of similar natives. However, top earners among EU migrants do not differ significantly from natives, which contrasts with the situation among top-earning non-EU migrants. These are

¹²We have run additional regions fixed effects and the results are robust. In the Appendix A.2, we show regressions where we also include age group fixed effects.

novel and important results. When one looks at the whole distribution of NFP across the population, EU migrants place a lower burden than the natives at low levels of NFP, whilst non-EU migrants contribute substantially more than natives at high levels of NFP.

Table 7: NFP along the quantiles

VARIABLES	Winsored OLS NFP	QR(0.05) NFP	QR(0.25) NFP	QR(0.5) NFP	QR(0.75) NFP	QR(0.95) NFP
EU Migrant	-1.564 (101.5)	613.5*** (139.5)	0.1 (4.043)	-17.98 (16.09)	4.836 (40.15)	-31.10 (168.6)
Non-EU Migrant	77.88 (92.25)	-1,260*** (351.9)	-12.24 (10.40)	-23.82* (12.73)	23.79 (39.62)	1,256*** (372.2)
Constant	1,357*** (194.1)	-4,737*** (561.7)	137.7*** (9.962)	278.1*** (20.67)	2,168*** (64.94)	13,958*** (785.3)
Observations	139,428	139,428	139,428	139,428	139,428	139,428
R-squared/ Pseudo R2	0.019	0.0240	0.0110	0.00519	0.0481	0.0862
Ind. and HH. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses. All values are deflated using 2007 as the reference year. The first column shows the OLS results when 1 per cent at each tail of the distribution of the NFP is winsored. All other columns report the results of quantile regressions. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Finally, we investigate the role of the estimated coefficients on individual regressors together with their confidence intervals in Appendix A.2. We show that the net fiscal position of households is strongly non-linear with respect to its key determinants. Notably, the effect of household size switches from negative to positive as we move up the quantiles of the distribution. Recalling that household size is not relevant at the mean, this result vindicates the choice of using a quantile approach. Furthermore, some non-linearities are different for migrants and for natives, especially in employment and education levels (by simple comparisons of the curves in Figures 6 in the AppendixA.4).

3.2 Allowing for heterogeneity in quantile regressions

We perform several heterogeneity exercises. As for the OLS analysis, we further explore the NFP of migrants in the $Q_{0.05}$ and in the $Q_{0.95}$ quantiles by splitting the original sample according to: the size of the household, more than 4 members (large households) or not (small household); level of education: holding a college degree or not; young versus not young; above or below the average age; individuals with bad and good health. We then run quantile regressions for the extreme quantiles $Q_{0.05}$ and $Q_{0.95}$. Table 8 shows the results for the lower and upper tail of the NFP distribution.

Reassuringly, all estimations reach similar results as our benchmark estimations. Among the bottom-earners (individuals with income laying in the 5th quantile), EU migrants who live in small households, in good health, irrespective of age and with no college degree, contribute fiscally more than natives of the same characteristics. By contrast, non-EU migrants belonging to all but one heterogeneity dimensions are more fiscally dependent than natives. Bottom-earners non-EU migrants who hold a college degree are not different from natives. Non-EU migrants in the upper tail of the in-

Table 8: Heterogeneity of the fiscal position of migrants

Panel A: The fiscal position of bottom-earners Q05								
	N > 4	N ≤ 4	Healthy	UnHealthy	Age < 40	Age ≥ 40	NoCollege	College
EU Migrant	-1,417* (836.4)	962.6*** (260.3)	752.0*** (250.2)	-1,597 (2,287)	513.1* (281.6)	938.8** (424.3)	1,076*** (299.5)	173.0 (430.2)
Non-EU Migrant	1,663** (760.1)	-1,703*** (468.5)	-1,182*** (388.2)	-1,731* (885.8)	-1,428*** (523.9)	-1,201** (564.0)	-1,618*** (532.8)	-983.6 (635.9)
Constant	1,682 (2,312)	-4,280*** (544.1)	-4,515*** (611.4)	-6,302*** (1,099)	-4,059*** (665.2)	-5,296*** (894.4)	-4,807*** (513.9)	-3,704*** (1,132)
Observations	14,395	125,033	124,097	15,331	71,377	68,051	101,852	37,576
Pseudo R2	0.0834	0.0359	0.0408	0.0461		0.0413	0.0434	0.0334
Ind. and H. Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: The fiscal position of top-earners Q95								
	N > 4	N ≤ 4	Healthy	Unhealthy	Age < 40	Age ≥ 40	NoCollege	College
EU Migrant	1,265 (2,336)	-92.58 (153.7)	37.68 (142.9)	-271.8 (802.9)	-82.38 (263.8)	156.5 (202.3)	-71.37 (149.0)	40.99 (221.0)
Non-EU Migrant	4,165* (2,530)	831.6* (438.2)	938.0*** (341.6)	5,169** (2,330)	1,332** (663.2)	1,224** (592.0)	272.1 (321.9)	3,421*** (222.6)
Constant	16,868*** (3,339)	12,224*** (650.8)	13,860*** (814.0)	14,242*** (1,663)	14,171*** (902.9)	13,673*** (955.4)	13,210*** (620.8)	16,188*** (1,476)
Observations	14,395	125,033	124,097	15,331	71,377	68,051	101,852	37,576
Pseudo R2	0.146	0.0969	0.0989	0.0933	0.0994	0.0970	0.0982	0.0999
Ind. and H. Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses. All values are deflated using 2007 as the reference year. All specifications are estimated with quantile regressions. *** p<0.01, ** p<0.05, * p<0.1

come distribution - top earners - contribute more than natives belonging to the same income quantile. These results are very stable and true for all heterogeneity dimensions considered. In no category of EU migrants analysed are top-earners contributing more than natives.

4 The Public Opinion on the Fiscal Position of Migrants in Europe

One last topic we want to explore is the link between the fiscal position of migrants and the public opinion towards it. Public opinion is a crucial aspect of the current debate on immigration. How natives perceive migrants may affect immigration policies as well as the integration of immigrants in the host country (Preston, 2014). It would be unrealistic to assume that native citizens have accurate knowledge about the fiscal impact of immigrants. It is thus important to investigate the extent to which public perceptions align with the actual evidence on the fiscal position of immigrants, and how such a (mis)alignment varies across countries.¹³

Heterogeneity among EU countries is relevant for another issue: selection of migrants. This paper is about differences between migrant-to-native populations in the destination country. This implies that our concerns about selection effects are mitigated by the fact that selection also shapes the migrant-to-native differences in which we are interested. Nonetheless, one might even argue that the migrants are selected and that is precisely why non-EU migrants contribute more in $Q_{0.95}$ and less in the lowest quantile $Q_{0.05}$. Does this selection exacerbate or attenuate fiscal differences with natives? What is the link between public opinion, selection and the actual fiscal position of migrants? In order to shed some light on this issue, we look into two groups of countries according to the public perception about the fiscal position of migrants, as recorded many years before the data on the fiscal position of migrants.

To do that, we refer to data from of the European Social Survey 2002.¹⁴ The survey questionnaire includes a series of questions aimed at measuring the perception of native European citizens about the impact of immigration on their country. Interestingly for our study, a more specific question explicitly asks about the perception of the *fiscal impact* of migrants in EU countries. We call this *fiscal perception*. The question in the survey is the following:

“Do you believe immigrants are taking more in services than what they are contributing to taxes?”

The answer is expressed as an ordinal variable where the answer zero means immigrants are perceived to take more in services than they pay in taxes, and ten means immigrants are believed to pay more taxes than they receive in services. For the year 2002 the average responses are clustered around the average of 4 (below 5), showing that Europeans mi-

¹³Different opinions and often hostility against migrants are influenced by political rhetoric, which in turn, in a circular argument, may affect the voting decision and thus politics (Benhabib (1996) and Dolmas and Huffman (2004)). In many European countries, parties at the edges of the political spectrum (particularly on the right) have been securing an increasing number of seats. This is the case both in national parliaments and—especially—in the European Parliament, where there has been a low voter turnout that has particularly benefited more extreme party platforms. Far-right and nationalist political parties, in particular, have successfully capitalized on concerns about immigration. In France, the far-right National Front, led by Marine Le Pen, unexpectedly took 25% of the vote in the 2014 European Parliament elections with a campaign that mainly fought against migrants. In the UK’s Brexit referendum campaign, UK politicians argued about an alleged negative impact of migrants on the national welfare system. In the presidential elections in Austria in 2016, a representative of the far-right, the Freedom Party of Austria, almost won the vote against the independent ecologist candidate, with similar anti-immigrants arguments. The European elections in 2019, marked the Lega Nord movement in Italy as the political winner of the polls. On January 31st, 2020, the UK left the European Union mostly with a view of being more “protected” from migrants from EU countries.

¹⁴More information on the database can be found at <https://www.europeansocialsurvey.org>. We use a very old information about the fiscal perception to avoid temporal collinearity of the information.

grants are perceived to be more fiscally dependent than fiscal contributors. Looking more closely at the distribution of responses, we find that around 60% of the answers claim that immigrants are fiscally dependent, whereas only 40% of the respondents state that immigrants are fiscal contributors. Moreover, public fiscal perception towards immigration varies considerably across countries, as evidenced in Figure 2 where different shadows of blue capture different levels of fiscal perception. Austria, Hungary, Germany, Poland, Ireland, Czech Republic and the UK are countries with a negative fiscal perception (*i.e.*, natives in these countries believe that immigrants receive more in services than they pay in taxes). By contrast, in Denmark, Island, Norway, Italy, Portugal and Sweden the perception of migrant's fiscal position is positive. To facilitate the comparison between perceptions and calculated NFP, we represent the NFP in Figure 3 for $Q_{0.05}$ and for $Q_{0.95}$. An interesting yet concerning pattern between perceptions and fiscal positions appears. In some countries where the NFP is positive, natives hold a negative fiscal perception (for instance, Austria, France, Belgium, the Netherlands, etc), whereas in countries where NFP is negative, natives tend to have a positive fiscal perception (Sweden, Denmark, Finland, etc).

We run our benchmark quantile estimations by pooling countries into two groups: countries with negative perception and countries with positive perception, both measured in 2002. Results are shown in Table 9. Natives in Denmark, Italy, Portugal, Sweden, Norway, among other countries, in the ESS 2002 wave tend to have a positive fiscal perception of migrants: they believe migrants pay more taxes than receive in social transfers. But as shown in the first three tables of Table 9 in these countries neither the poorest group of migrants nor the richest one among non-EU migrants are different from natives in terms of NFP, however bottom-earners among EU countries are indeed fiscal contributors.

By contrast, the last three columns in Table 9 include countries such as Hungary, Austria, Belgium, Netherlands, Ireland, France, and the UK, among others, where natives show a negative fiscal perception in the 2002 wave of the ESS. In these countries we find similar results: non-EU migrants of the lowest quantile are fiscally dependent, however, the top earners among non-EU countries are more fiscal contributors than natives. In addition, EU migrants in either of the extreme quantiles are no different than natives. Such results shows that in these countries, there is a misperception about the fiscal contribution of migrants as the perceptions of natives are exclusively aligned with the fiscal position of the lowest income quantile and ignore the fiscal contribution of migrants belonging to the 95th quantile or the position of EU migrants.

It seems that in Hungary, Austria, Belgium, Netherlands, Ireland, France, and the UK the most vulnerable part of society is on average fiscally dependent, irrespective of whether they are natives or migrants. This result suggests that fiscal dependency in these countries is not merely a migrants' problem. It is instead an issue for the whole country which also affects migrants. Quite the opposite holds in countries (like Denmark, Italy, Portugal, Sweden, Norway and Island) where natives have a positive fiscal perception about migrants. In these countries, not only are vulnerable groups better protected, but also migrants are better fiscally integrated, allowing for better social cohesion.

Lastly, it is worth to note that most countries where the public opinion about migrants fiscal contribution is positive are countries where the welfare system is generous. By contrast, in countries where the public opinion is negative the welfare system is not always generous. If the welfare magnet hypothesis were true, the low-skilled migrants would target countries such as Denmark, Italy, Portugal, Sweden, Norway to exploit the welfare system. This hypothesis is in

net contrast with the results we find in Table 9. Neither migrants nor natives in the $Q_{0.05}$ are fiscally dependent in these countries.

Figure 2: Fiscal Perception in Europe, 2002

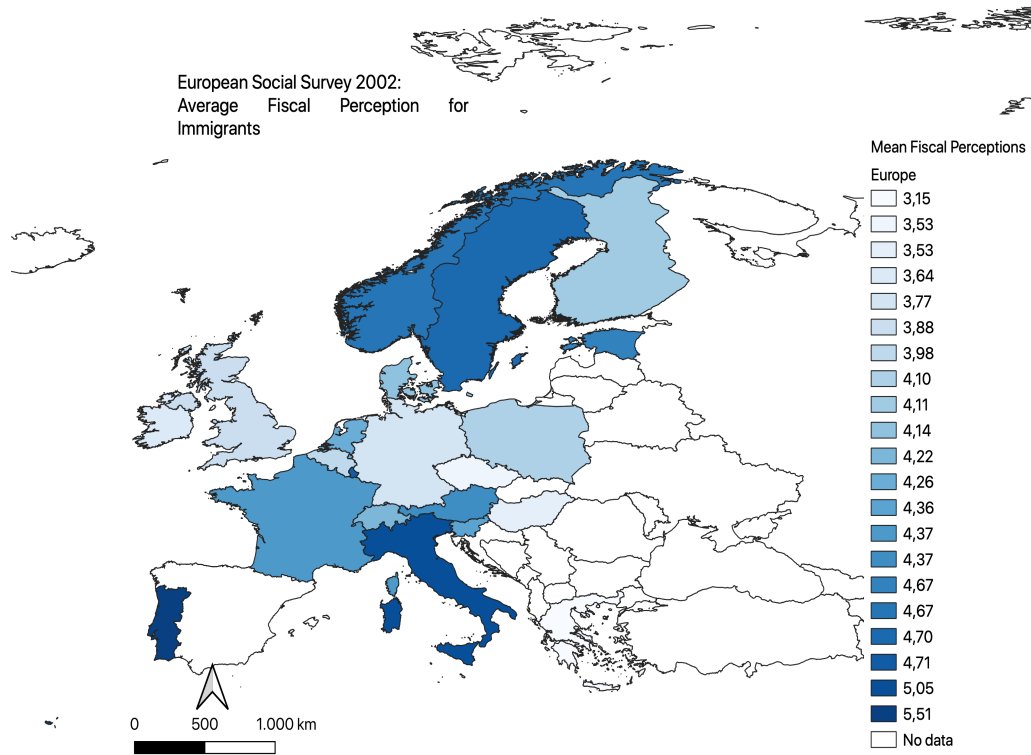


Figure 3: Average Fiscal Position of Migrants across European countries

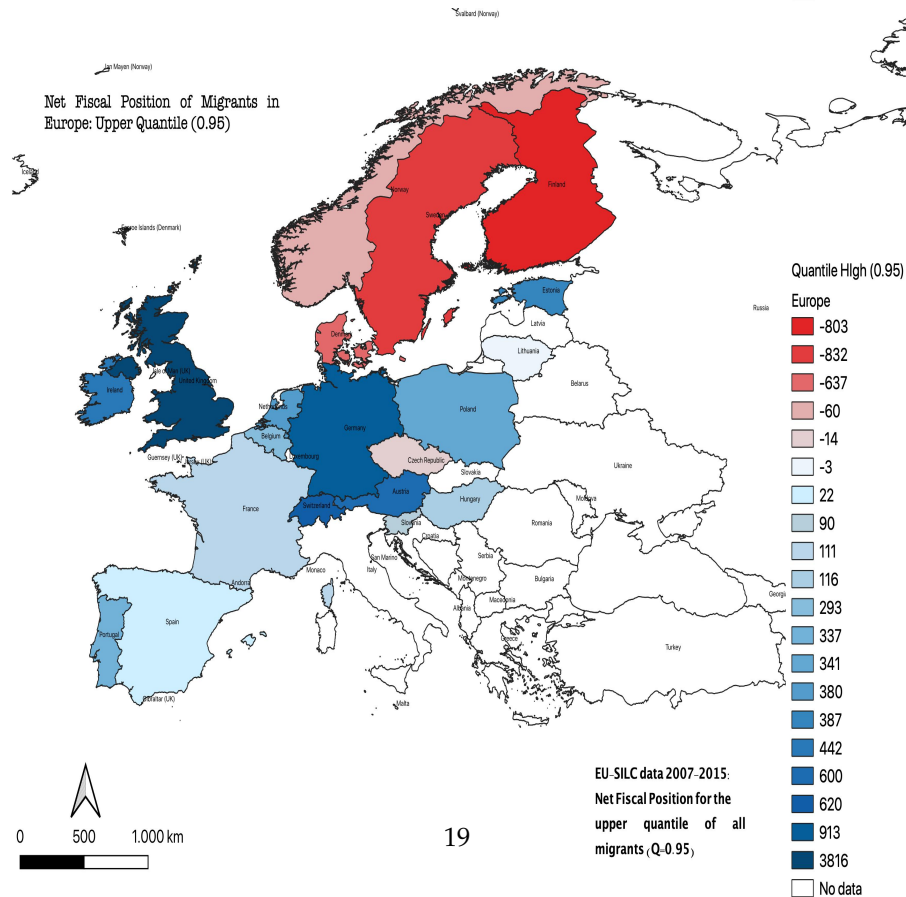
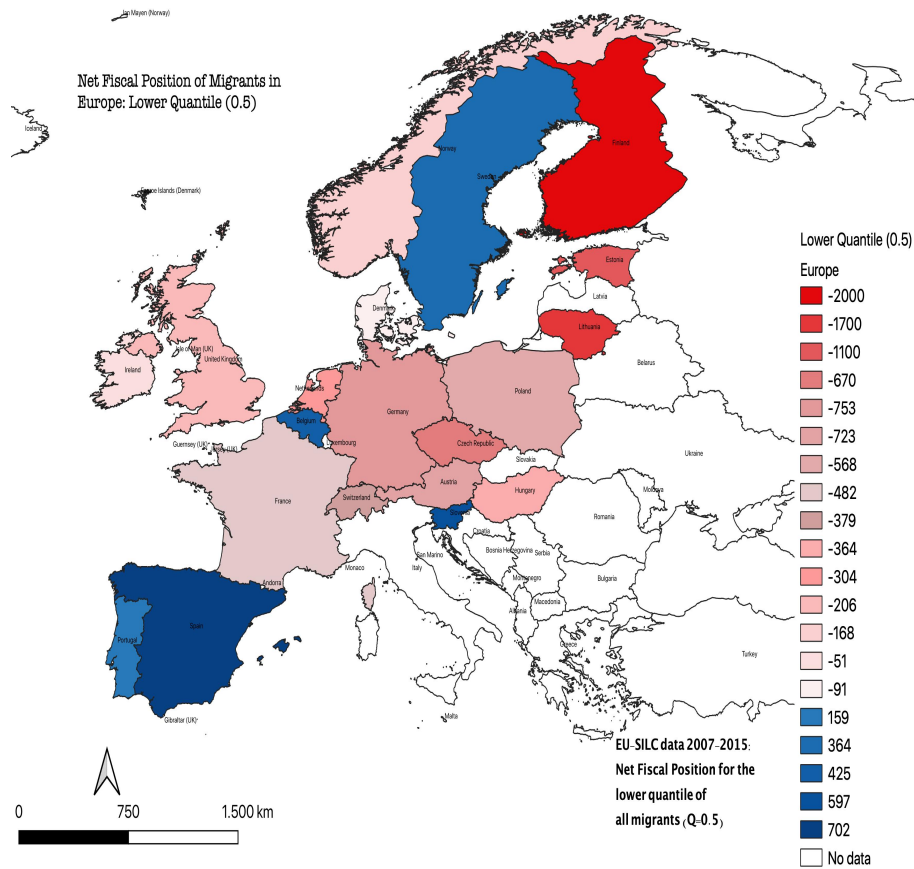


Table 9: NFP in Quantiles and fiscal perception in 2002

VARIABLES	Positive perceptions			Negative Perceptions		
	OLS	Q05	Q95	OLS	Q05	Q95
EU Migrant	-49.59 (405.3)	441.2** (195.1)	-397.0 (315.1)	-83.89 (207.5)	840.9 (632.8)	69.33 (423.5)
Non-EU Migrant	-169.9 (178.8)	-633.6 (511.8)	-86.01 (295.4)	171.3 (204.1)	-1,417** (662.1)	1,812*** (458.5)
Constant	1,825*** (340.9)	-5,190*** (604.3)	18,929*** (662.7)	2,117*** (226.7)	-4,305*** (656.6)	13,791*** (704.5)
Observations	45,749	45,749	45,749	53,611	53,611	53,611
R-squared or Pseudo R2	0.021	0.0428	0.117	0.019	0.0389	0.0872

Robust standard errors in parentheses. All values are deflated using 2007 as the reference year. The second, third, fifth and sixth specifications are estimated using quantile regressions. The first and forth using OLS. Negative migrant perception countries in 2002 include Austria, Belgium, Bulgaria, Czech Republic, Spain, France, Hungary, Netherlands, Ireland, and the UK. Positive migrant perception countries in 2002 are Germany, Denmark, Poland, Italy, Lithuania, Latvia, Portugal, Sweden, Norway and Island. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

5 Conclusions

Understanding the fiscal effects of migration is crucial for policymakers and researchers alike (Chojnicki et al. (2011)). It provides insights into whether immigration policies result in economic benefits or costs for destination countries (Gabszewicz and Zanaj (2020)), particularly regarding public spending. Our paper contributes to this understanding by examining the fiscal position of migrants in EU countries and offering evidence to inform policy-making decisions.

Contrary to common objections regarding immigrants' perceived burden on public finances, our findings demonstrate that migrants are rarely more fiscally dependent than natives across income quantiles in the investigated EU countries. This challenges the notion that immigrants are a significant drain on public resources. In fact, in countries like Belgium and the Netherlands, where negative fiscal perceptions exist, immigrants in the 95th quantile exhibit a net positive fiscal position, indicating that they contribute more to the public finances of their destination countries compared to native citizens. Additionally, our analysis reveals some differences between EU and non-EU migrants. EU migrants tend to benefit more from cash and child benefits compared to native citizens, while non-EU migrants, on average, do not benefit from social transfers relative to the native population.

Our analysis suggests that countries with negative fiscal perceptions of migrants tend to have higher fiscal dependency among the most vulnerable sections of society, including both natives and migrants. Conversely, countries with positive fiscal perceptions show lower fiscal dependency within these sectors. Interestingly, citizens and migrants in the highest quantile contribute less in countries with positive fiscal perceptions compared to their counterparts in countries with negative perceptions. One possible explanation for this pattern is the presence of Nordic countries among those with positive fiscal perceptions. These countries have welfare states that prioritize participation, egalitarianism, and extensive benefit levels. Their commitment to social cohesion and universal welfare provisions safeguard individual rights and protect vulnerable individuals and groups. In these countries, both migrants and natives in the lowest quantile

exhibit lower fiscal dependency, suggesting successful fiscal integration for migrants. In contrast, countries where social cohesion is already compromised among natives tend to extend this to migrants as well, reinforcing negative perceptions that do not align with migrants' actual fiscal contributions.

To conclude, our findings highlight the importance of considering migrants' fiscal contributions in shaping public perceptions and policies. By recognizing the positive fiscal impacts of migrants and focusing on social cohesion and inclusive welfare provisions, policymakers can foster successful fiscal integration and challenge negative perceptions surrounding migration.

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A Appendices

A.1 EU-SILC Database and Variables definition

EU-SILC (Community Statistics on Income and Living Conditions) is a survey of comparable cross sectional and longitudinal multidimensional micro data on income poverty and social exclusion in Europe. This instrument is anchored in the European Statistical System (ESS). EU-SILC was launched in 2004 in 13 MS (all except NL, DE, UK and the 10 new MS except EE) + NO and IS. The instrument aims to provide two types of data: (i) Cross-sectional data pertaining to a given time or a certain time period with variables on income, poverty, social exclusion and other living conditions, and (ii) Longitudinal data pertaining to individual-level changes over time, observed periodically over, typically, a four years period.

According to the Commission Regulation on sampling and tracing rules (Nr. 82/2003 of 21 October 2003), the sample selection has to fulfill the following requirements:

(i) For all components of EU-SILC (whether survey or register based), the cross-sectional and longitudinal (initial sample) data shall be based on a nationally representative probability sample of the population residing in private households within the country, irrespective of language, nationality or legal residence status. All private households and all persons aged 16 and over within the household are eligible for the operation.

(ii) Representative probability samples shall be achieved both for households, which form the basic units of sampling, data collection and data analysis, and for individual persons in the target population.

(iii) The sampling frame and methods of sample selection shall ensure that every individual and household in the target population is assigned a known and non-zero probability of selection.

The cross-sectional sample sizes were calculated in order to achieve an effective size of 121.000 households at the European level (127.000 including Iceland and Norway). Then, the allocation among the countries aims to ensure a minimum precision for each of them. The longitudinal sample sizes refer, for any pair of consecutive years, to the number of households successfully interviewed in the first year in which all or at least a majority of the household members aged 16 or over are successfully interviewed in both the years. The income information for different countries relies on different sources. Some countries use administrative data, whereas some other use self-declared information. A detailed analysis may be performed by splitting this two source of information. For more details see: Eurostat EU-SILC <https://ec.europa.eu/eurostat/web/microdata/european-union-statistics-on-income-and-living-conditions>

Table 10: Variable Description: EU-SILC 2007-2015

Variables	Categories	Description
Net Fiscal Position	Continues	Variable constructed based on: Difference between Taxes and Social benefits within the house for one year
Taxes		Tax on Income; Local Taxes; Pension Contribution
Social Transfers		Social assistance; Housing benefits; Sicknes benefits Unemployment Benefits; Education Allowances; Public Health Service Disability Allowances; Family related Allowances; Subsidies for marginal groups
Countries Included	Binary	Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Germany, Denmark, Estonia, Spain, Finland, France, Hungary, Ireland, Iceland, Italy, Lithuania, Luxembourg, Latvia, Netherlands, Norway, Poland, Portugal, Romania, Sweden, Slovenia, Slovakia, United Kingdom
Individual Level Controls		
Age	Continuous	Age for the whole Sample : 18- Years
Male	Binary	Dummy variable: 1=Male; 0=Female
Married	Binary	Dummy variable:1=Married or living in couple; 0=otherwise
Education Level	Binary	Dummy variables for: No Qualification, Primary, Lower Secondary, Upper Secondary, Post-Secondary, Tertiary
Unemployed	Binary	Dummy Variable: 1=Unemployed, 0=Otherwise
Health Status	Binary	Dummy variables for: Very Good, Good, Fair, Bad and Very Bad
Household Level Controls		
Household Size	Discrete	Number of People in the Household [1-10]
Degree of Urbanization	Continues	
Poverty Indicator	Binary	

A.2 Robustness Analysis: Including Age Fixed Effects

In order to capture a more flexible functional form of NFP over age, we include age dummies for all the baseline regressions (OLS and Quantiles). The main purpose is to examine whether there are any significant differences in the NFP of migrants versus natives, when we account for age fixed effects. The other aim of including age dummies in the regressions is to indirectly account for migration duration in the host country. As it is shown in (Blau, 1984), migrants tend to change their fiscal position according to the time spent in the hosting country. EU-SILC does not contain the information about the length of the time participants have migrated, thus we can not directly control for this variable. But including age-dummies, may mitigate this problem. As it is shown in the table 11, the NFP of both type of migrants doesn't change compared to the baseline estimation where age is included as a continuous variable. The magnitude of the coefficients for both tails of the NFP distribution for Non-EU migrants is still significant.

Table 11: Net Fiscal Position along the quantiles

VARIABLES	Winsored OLS NFP	QR(05) NFP	QR(0.25) NFP	QR(0.5) NFP	QR(0.75) NFP	QR(0.95) NFP
EU-Migrant	29.90 (183.56)	602.73 (494.80)	4.25 (53.28)	-18.63 (51.34)	-27.80 (97.49)	-158.53 (589.21)
Non-EU Migrant	29.67 (115.40)	-1080.42** (404.10)	-16.17 (43.51)	-22.27 (41.93)	-3.00 (79.62)	999.24* (481.21)
Constant	1452.34*** (342.27)	-2716.3677* (1159.02)	132.54 (124.8164)	246.74* (120.26)	1732.70*** (228.36)	12567.27*** (1380.17)
Ind. and HH. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	139,428	139,428	139,428	139,428	139,428	139,428

Robust standard errors in parentheses. All values are deflated using 2007 as the reference year. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

A.3 Quantile distribution of significant covariates

Figures 4 and 5 show the results for the quantile distribution of the significant covariates for migrants. Household size has a negative and significant coefficient for households on the left tail of the NFP distribution and a positive and significant coefficients for household on the right tail of the distribution; by contrast, OLS finds, on average, a small positive and significant effect from household size on NFP across the whole distribution. Marital status has a positive and significant effect both for households with low and with high NFP. Primary education has a negative and significant effect only for families with low NFP, whereas OLS finds a negative and significant coefficient throughout the distribution. The benchmark level education is no education at all. Lower secondary education would be negative and significant for low NFP households, in contrast to OLS estimates which find no significant effect.

The employment status is only significant at the extremes of the distribution, again in contrast to OLS which finds a negative effect on average for all households. The coefficients on poverty indicator are negative and significant, as in the OLS estimations, but display significant non-linearity and a well-defined inverted-U shape pattern. Figures 4 and

5 show the estimated coefficients and standard errors for EU migrants and non-EU migrants respectively, both for the quantile regressions and for OLS. We can see a number of notable differences in the effects of some variables relative to the population of natives.

Primary education has a negative effect on net fiscal position at low levels of the distribution for natives, but not for migrants from either EU or non-EU countries. Marital status is only marginally significant for natives at the extremes of the distribution, but is highly positive and significant for non-EU migrants. The employment status has a strong negative effect at the negative and (especially) at the positive tail of the distribution for natives, but it has a negative effect for EU migrants at low quantiles of the distribution only, and is not significant for non-EU migrants.

Figure 4: Quantile distribution of significant variables for EU migrants

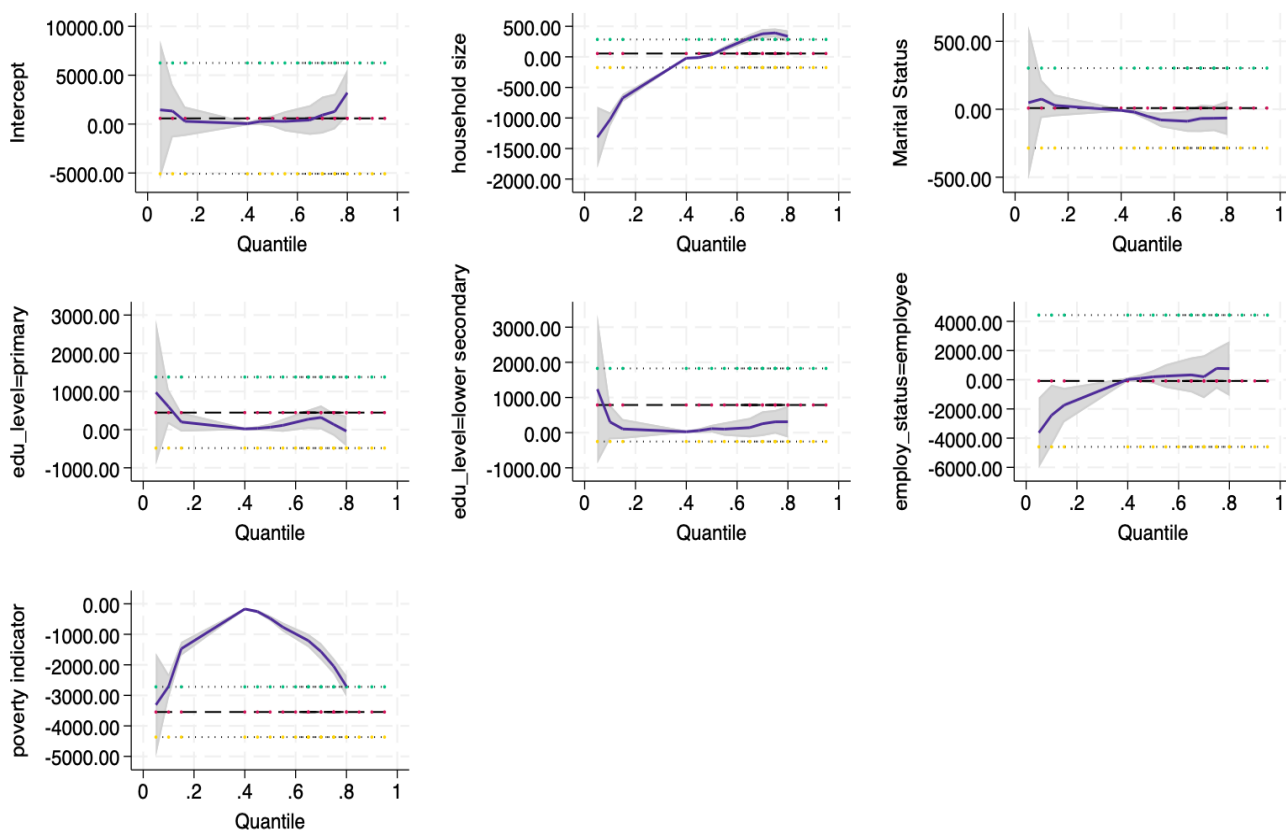
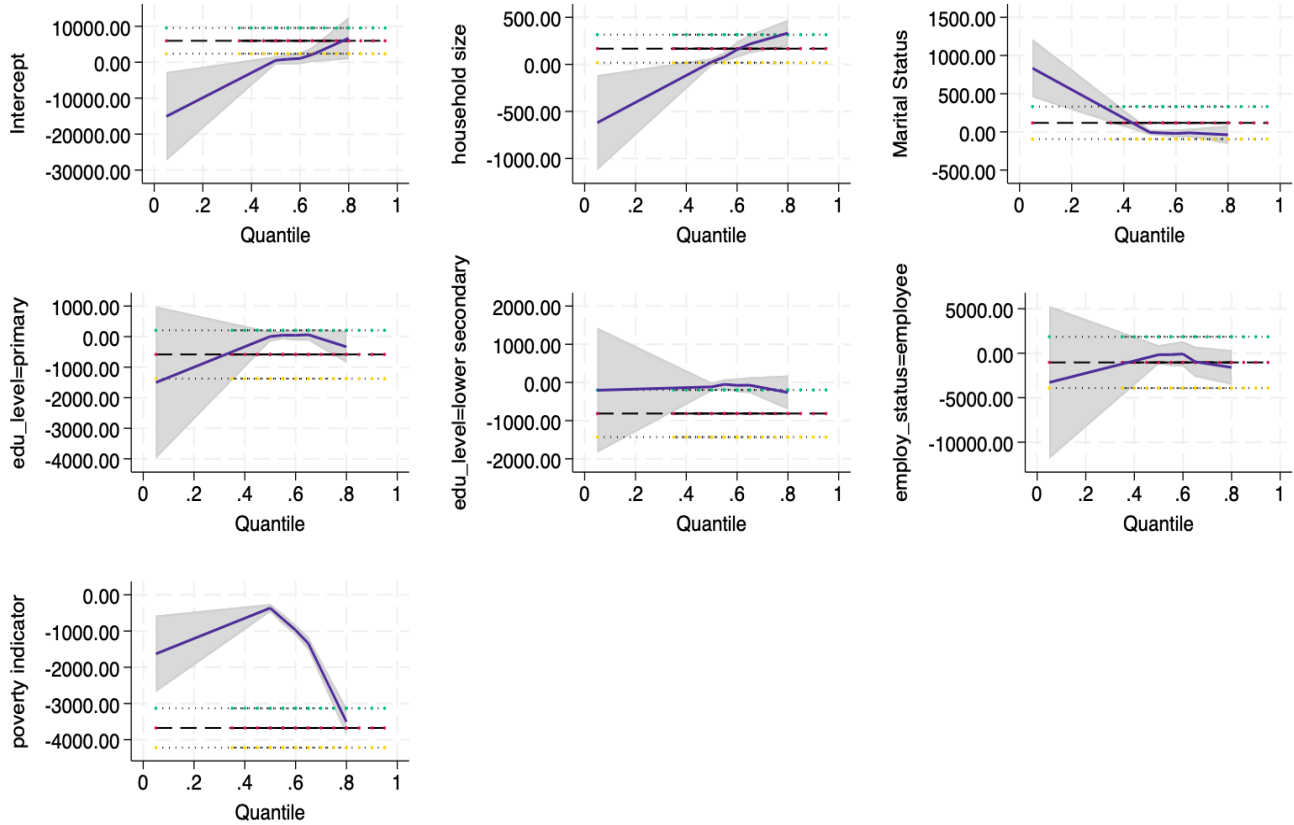


Figure 5: Quantile distribution of significant variables for Non-EU migrants



A.4 Non-parametric tests

To explore the geographical distribution of migrants across EU countries, we conducted some non-parametric tests like the value of the skewness of the distribution by each country in the panel. We find that the distribution of the NFP in most of the countries is right-skewed and not normal (Table 12). Exception to this result is Denmark that shows a left-skewed distribution. As expected, this non-parametric test shows that the distribution of the NFP is not normal. We also perform a test of equality of the distributions (natives vs migrants, where EU and non-EU migrants are pooled in one category for numerosity issues) and get some interesting results. These results are reported in Table 12 and Figure 6. The K-S test shows us that in most of the countries the distribution of the NFP between the migrants and the natives is not different, except in countries like: Denmark, Sweden and Slovenia (and less so in Germany and Portugal).

Table 12: Non-parametric estimation for the fiscal distribution between natives and migrants

Country	(1) Skewness(natives)	(2) Skewness (migrants)	(3)) K-S Test (Combined)
Austria	4.43	2.96	0.845
Belgium	4.55	13.21	0.162
Bulgaria	25.05	11.08	0.211
Czech Republik	11.13	9.03	0.622
Germany	17.04	16.07	0.016*
Denmark	-12.64	2.35	0.053**
Estonia	7.21	4.81	0.748
Spain	4.45	5.15	0.013*
Finland	7.73	3.79	0.221
France	8.91	4.04	0.47
United Kingdom	6.04	13.79	0.919
Hungary	6.72	6.67	0.113
Greece	3.03	3.06	0.94
Ireland	7.79	-9.99	0.636
Italy	3.51	13.09	0.181
Latvia	10.26	2.2	0.846
Lithuania	5.84	6.26	0.673
Luxembourg	6.23	10.13	0.498
Netherlands	3.8	8.64	0.146
Norway	5.04	-0.19	0.798
Poland	9.12	5.14	0.09*
Portugal	6.67	6.17	0.043*
Romania	10.27	11.2	0.635
Sweden	4.26	8.96	0.004**
Slovenia	2.54	4.65	0.001**
Slovakia	8.08	4.26	0.68

Notes: The value of Skewness indicates the direction of the distribution.

K-S Test is the Kolmogorov–Smirnov test for the equality of distribution between natives and migrants

Figure 6: Kolmogorov–Smirnov test for equality of distribution of Fiscal position (migrants vs natives)

