FEM43-17

FEMISE RESEARCH PAPERS

The economic contribution of immigration on Europe:

Fresh evidence from a "hybrid" quantile regression model

Directed by: Jamal Bouoiyour
(IRMAPE, ESC Pau Business School, France and
CATT, University of Pau, France)

With Contributions by:

Amal Miftah (IRMAPE, ESC Pau Business School, France and LEDa, DIALUMR 225, University of Paris-Dauphine, France)
Refk Selmi (IRMAPE, ESC Pau Business School, France and CATT, University of Pau, France)

September 2019

Ce rapport a été réalisé avec le soutien financier de l'Union Européenne dans le contexte du projet UE-FEMISE sur: "Support to economic research, studies and dialogue of the Euro-Mediterranean Partnership". Le contenu du rapport relève de la seule responsabilité des auteurs et ne peut en aucun cas être considéré comme reflétant l'opinion de l'Union Européenne.

This document has been produced with the financial assistance of the European Union within the context of the EU-FEMISE project "Support to economic research, studies and dialogue of the Euro-Mediterranean Partnership".. The contents of this document are the sole responsibility of the authors and can under no circumstances be regarded as reflecting the position of the European Union.

The economic contribution of immigration on Europe: Fresh evidence from a "hybrid" quantile regression model[1]

Jamal Bouoiyour[a, b, 2], Amal Miftah[a, c], Refk Selmi[a, b]
[a] IRMAPE, ESC Pau Business School, France
[b] CATT, University of Pau, France
[c] LEDa, DIALUMR 225, University of Paris-Dauphine, France

Abstract: Both forced and voluntary migration have become one of the core concerns in the public debate in many important receiving countries as Europe over the past few years. The contemporary refugee crisis and the noticeable changes in migration trends and policies led us to reconsider the economic contribution of such inflows of migrations to European countries. Using a panel quantile regression technique, we assess the distributional heterogeneity in the relationship between immigration and economic growth and unemployment. To deal with the potential endogeneity of migration variables, we test whether specific parts of the conditional distributions of growth and unemployment are significantly affected by endogeneity. Then, we exclusively use a two-part-effects modeling framework, namely "hybrid" model, that allows to mix exogenous and endogenous parts. Our results provide some support for the hypothesis that refugees and other legal migrants do not impede economic growth, and limit employment opportunities of residents in host countries. But these effects are not homogeneous across various quantile levels. It is therefore necessary to take into account the economic circumstances of host countries (in particular, the levels of economic growth and unemployment).

Keywords: migration, refugees, economic growth, unemployment, Europe, distributional regression, endogeneity in conditional quantiles.

JEL classification : E20, F22, J61.

[1]***Acknowledgement:*** The authors gratefully acknowledge the financial support of FEMISE. The content of this paper has been presented at FEMISE annual conference held in Valletta, Malta, on the 7th, 8th and 9th of February 2018. We are extremely grateful for all the participants and referees for helpful discussions and detailed comments on earlier version of this article. We also thank Pr. Christophe Muller for providing in-depth comments, which have strengthened the manuscript. Remaining shortcomings are the responsibility of the authors.
[2]*Corresponding author* : Tel: +33 0559408001, Fax: +33 0559408010, Email: jamal.bouoiyour@univ-pau.fr

1. Introduction

War, extreme violence, human right violations and persecution worldwide are prompting millions of people to be involuntarily displaced. In 2015, the number of forcibly displaced people in the world was the highest ever recorded, having reached 65.3 million. This number has risen sharply in five years, from 42.5 million in 2011 to 45.2 million in 2012, 51.2 million in 2013 and 59.5 million in 2014 (UNHCR, 2015). Refugees abroad represent only a fraction of the population displaced by war and conflicts (nearly 21.3 million persons in 2015). Most of the increase happened between 2012 and 2015 was mainly driven by the onset of the Arab Spring and thus the new or reignited conflicts as in Syria, Iraq and Libya, together with older crises as in Afghanistan or South Sudan. It has made the refugee crisis a global crisis and has created from the beginning a climate of heightened uncertainty surrounding its political, economic and societal implications in many developed countries. But much international attention has focused on asylum seekers and migrants arriving in Europe during 2015 by sea and the dramatic increase in their number. In the European framework, the recent refugees' inflows were led to controversial discussions about their long-term implications and marked a shift in the European position towards the arrival of refugees. This happened at time Europe seemed entangled in the economic crisis of 2008 with a long period of weak growth and high unemployment. Also, immigration issues have come to the forefront due to the problem of rapidly ageing populations and to an anti-immigration sentiment that is on the rise across the continent. Such situation raises fundamental questions about the long-term social, economic and fiscal effects of immigration inflows toward this continent. Should European countries be concerned with the e□ects of such inflows? The main purpose of this paper is to assess the potential economic consequences of immigration for European economies. While special attention has been devoted to the analysis of how such inflows of immigrants have affected some aspects of host economies such as labor markets

and economic growth[3], the impacts of the different types of immigration (i.e., refugee and non-refugee) on the receiving country's economy have not received enough attention among policy makers and academic studies. Our contribution is to identify these effects on European countries by distinguishing between general migration, economic migrants and refugees. In fact, most of these studies is relative to the United States (inter alia: Card 2007, Peri and Sparber 2009, Peri 2010). Also, less attention has been devoted to the macroeconomic contribution of refugee inflows on European countries. These inflows are relatively low compared to other forms of migration (see Appendix Figure A1) but are they more harmful to the European economies? Although the potential consequences of the refugee acceptance are being largely discussed, evidence is fragmentary. Some investigations centered around concerns about short-run costs of absorbing refugees (public expenditure related to the care and maintenance of the refugees) or about the obstacles they face throughout their integration process in host countries (for instance, Costa-Lascoux 1987, Frigoli and Jannot 2004, Métral and Padovani 2016), but curiously, empirical evidence on how an influx of refugees affects the hosting economies is rather very limited, probably due to the absence of harmonized international data on migration flows, disaggregated by, inter alia, migratory status (i.e., asylum seekers, refugees, economic migrants and migrant families). In addition, the economic effects of refugee migration are still understudied and not well understood because the context in which forced migration takes place is usually distinct from that of economic migration. In fact, in contrast to refugees, economic migrants not only decide whether or not to migrate but

[3] An influential strand of the literature documented that immigration inflows has a positive impact on host country economic growth and labor market (Felbermayr et al, 2010; Boubtane et al., 2012; Ortega and Verdugo, 2014; Jaumotte et al., 2016) but the nature, persistence and size of this effect depend on the context of analysis (time period, country coverage and the conducted methodological approach, see Borjas (1994)). The effects of these inflows are sometimes controversial, in part, because of their sheer size and their skill composition. Also, a long literature in labor economics has reached something of a consensus that the e□ects of immigration on unemployment is generally so small or unimportant as to be not worth considering (see, for example, Hunt, 1992; Jean and Jimenez, 2007, Simon et al. 1993; Pischke and Velling 1997; Dustmann et al. 2005) and vary with institutions that affect labor market flexibility (Angrist and Kugler, 2003).

also which country to migrate and thus weigh the benefits of this decision[4]. And countries that host refugees do so for humanitarian not economic reasons. For many of these host countries, forced migration pose a wide range of social and budgetary challenges but may also offer economic opportunities. Over the past decades, the rarely interest in macro- level impacts has led to an attempt to measure the costs associated with hosting large numbers of refugees that can yield to slower economic growth by draining public resources. Arguably, the study of the International Monetary Fund (2016) showed that in the short term, the refugee crisis leads to a relatively moderate increase in the GDP growth in European countries, reflecting the fiscal expansion associated with support to the asylum seekers, as well as the expansion in labor supply as the newcomers begin to enter the labor force. The medium- and long-term impacts of the refugees on growth are likely to be sensitive to how they will be integrated in the labor market. In the case of Germany, which has received the highest number of new asylum applications in Europe in 2015, Weber and Weigand (2016) found that non-refugee immigration has more beneficial effects on GDP growth and labor market in the medium-term. More accurately, the refugee wave shock first causes some positive (demand-side) reactions, but then decreases per capita GDP as well as the wage share and increases the unemployment rate. Nonetheless, these effects recede over time. More recently, D'Albi et al (2018) argued that an inflow of asylum seekers takes longer to significantly affect the economy of Western Europe; they found a significant positive effect on GDP over 3 to 7 years after the migration shock. Given these considerations, it seems of paramount importance to treat migrants as heterogeneous groups of individuals. That said, identifying the economic contribution of migrants who arrived for humanitarian or economic reasons to Europe would elucidate our understanding to a debated aspect that has so far generated more heat than light. The purpose of this paper is to discuss the economic impact of legal migration in terms of

[4]Note that according to the UNHCR's latest global trends report, developing regions continue to host the majority of the world's refugees (about 80% in 2016).

growth and unemployment of the currently resident population in a large panel of European countries (that is excluding the countries of Eastern Europe). Our analysis sheds new light on the complexities of the immigration issues, by explicitly distinguishing refugee migration and economic migration. In other words, due to the different characteristics of refugee and economic migrants, a potential question is to assess whether these differences have any economic implications. Refugees occupy an essential place throughout this paper since, apart from humanitarian aspects, integration of accepted refugees is also prominent for social, economic, budgetary and other reasons. And host countries often tend not to have economic integration of the refugee migrants as their main objective. This study uses a panel quantile regression approach to explore, from a new perspective, the relationship between specific migration sub-categories and economic growth and unemployment. One of the most appealing characteristics of this econometric tool is its ability to estimate specific effects that accurately depict the impact of covariates not solely on the center or the mean but also on tails of the distribution. Even though the mean effect offers far-reaching summary statistics of the impact of a covariate, it fails to describe the complete distributional effect. A major feature of the quantile regression method here is to allow the estimated slope parameter to vary with the quantile value of the dependent variables (i.e., the economic growth and the unemployment rate). This would in turn help to provide accurate information on the growth and employment impacts of immigration (all migrants, refugees and economic migrants) depending to the economic conditions: favorable (indicated by high economic growth and low unemployment) and unfavorable (indicated by low economic growth and high unemployment). Dealing with endogeneity in conditional quantiles constitutes another contribution of the present research. In other words, we perform IV quantile estimation to address the potential endogeneity of immigration inflows arising from measurement error, omitted factors, and/or reverse causation. Contrary to some studies that have tested for the effects of immigration on natives'

wages and employment using refugee inflows as natural experiments (Borjas and Monras, 2017; Clemens and Hunt, 2017), in this paper, we also address the endogeneity of these inflows. Such papers suggested that the involuntary nature of these refugee inflows implies that they can sometimes provide an exogenous source of variation in the level of immigration across space or time (OECD, 2018). Also, some empirical researches claimed that the presence of endogeneity in either the conditional mean or a particular conditional quantile means that the entire conditional distribution is contaminated by endogeneity (see, for instance, Chen et al., 2003). But it seems more reasonable to suppose that endogeneity can happen in only some parts of the conditional distribution of the dependent variables. A substantial methodological contribution of our paper consists of pursuing a fine analysis of the endogeneity by attempting to accurately identify the specific parts of the time series where the relationship between growth (or unemployment) and immigration is established using quantile regression model. We can think of the endogeneity issue in this relationship due to simultaneity or reversed causality by stating that good economic conditions may influence immigration, by attracting more migrants (at least economic migrants). Indeed, we contribute to the existing literature by analyzing finely this reverse relationship. In other words, we want to know in which part of the distribution, the reverse association occurs. Concretely, it may be thought that migrants do benchmarking by selecting, for instance, countries with high economic growth (and / or low unemployment). We therefore separately identify - thanks to a test for endogeneity in conditional quantiles- the parts where the relationship between migration and growth (or between migration and unemployment) is exogenous, as well as the specific parts where this relationship is rather endogenous. In doing so, we will only correct for endogeneity in the latter case. Clearly, we will have a model composed of both endogenous and exogenous parts, which we call the "hybrid" model. This allows us to consider a relationship, which can be described as more "realistic", between different migrant

groups (refugees, workers and all migrants) and economic outcomes. The problem of endogeneity of immigration is solved using the geographical component of migration as an instrument. This is the first time, to our best knowledge, that such a "hybrid" model is used when implementing the estimation strategy in the context of migration. In doing so, we establish a non-negative e□ect of immigration on per capita growth and on employment.

The following section discusses the methodological and data challenges in estimating the economic impact of refugees and migrants on host countries. Next, we report the main empirical findings and discuss their sensibility with respect to sample period. Finally, we conclude and provide some relevant policy responses to mitigate the adverse aspects and strengthening the development potential of large-scale refugee flows.

2. Methodology and data

2.1. Methodology

2.1.1. Quantile regression for panel data

Although the economic consequences of immigration have devoted particular attention, most studies ignore the fact that the effect of immigration could vary throughout the distribution of the dependent variables such as economic growth and unemployment rate. Throughout the present research, we conduct a panel quantile regression (QR) model with fixed effects to assess how immigration in Europe is significantly associated with variations in economic growth and unemployment rates. As such, this econometric tool enables to investigate the relationship between a set of covariates and the various parts of the response distribution. In addition to the motivation with respect to extremely elaborate view, quantile regression can also be motivated from a robustness point of view. Wider deviations from the regression line can significantly affect the fit of ordinary least squares (OLS). Standard linear regression techniques provide information regarding the average linkage among a set of

regressors and the outcome variable based on the conditional mean function $E(\mathbf{Y}|\mathbf{X})$. This provides only a partial view of the relationship, as we might be interested in depicting the link at various points in the conditional distribution of $\mathbf{Y}$. Quantile regression offers this capability. In general, median estimators and quantile estimators are less impacted by outlying observations in the response variable depending on covariates (Koenker and Bassett 1978; Konker 2005). Moreover, it seems prominent to point out that covariates can have an impact on the dispersion of the response variable and its location. In the presence of heteroskedasticity, contrary to mean regression, the quantile regression provides more flexibility of covariate effects. It must be added that OLS is inefficient if the errors are greatly non-normal and QR is more robust to non-normal errors and outliers. By pursuing this methodology, we are able to examine the determinants of the dependent variables throughout their respective conditional distributions, with particular focus on countries with the most and least real GDP per capita growth and unemployment rate– those that arguably are of the most interest. Overall, the focus on the mean effects may under- or over-estimate the proper coefficient estimates, or may even fail to capture significant linkages (Binder and Coad, 2011). Another major characteristic of the quantile regression estimator is its robustness and less sensitivity to outliers (Koenker and Hallock, 2001). Moreover, it is robust to skewness (asymmetry), heteroskedasticity, which are common properties of macroeconomic and financial data. This technique enables to estimate multiple ranges of changes (i.e., slopes) from the minimum to the maximum responses. The coefficients of the τ^{th} conditional quantile distribution are estimated as:

$$\hat{\beta}\ (\tau) = \arg\min \sum_{t=1}^{\tau} (\tau - 1_{\{Y_t \prec X_t\beta(\tau)\}}) \left| Y_t - X_t\beta(\tau) \right| \qquad (1)$$

where the quantile regression coefficient $\beta(\tau)$ determines the dependence between the vector X (independent variables or the vector of regressors) and the τ^{th} conditional quantile of Y (the dependent variable). To determine Y in function of specific independent series, the values of quantile coefficients could be constant where the values of $\beta(\tau)$ do not change noticeably for the values τ. Moreover, it should be symmetric (asymmetric) where the values of $\beta(\tau)$ are likely to be similar (dissimilar) for bottom and upper quantiles.

Considering a panel quantile regression approach with fixed effects denoted as

$$Q_{Y_{it}}(\tau_k / \alpha_i, X_{it}) = X_{it}\beta(\tau_k) + \alpha_i \qquad (2)$$

The major challenge with panel quantile regression with fixed effect is that the incorporation of a wide number of fixed effects (α_i) may be significantly affected by a incidental parameters problem (Lancaster, 2000). Accordingly, the estimator will not be the same throughout the distribution when the number of cross-section al units goes to infinity whereas the number of observations for each cross-sectional unit is finite (Kato and Galvao, 2010). The standard differencing approaches to overcome unobserved fixed effects is inappropriate in the quantile regression model. The latter are mainly based on the fact that expectations are linear operators, which is not in line with quantiles properties (see for instance, Canay 2011; You et al. 2015). This can be regarded as one of the major reasons why the empirical literature carrying out panel quantile regression model with fixed effects is very limited. In an attempt to properly deal with this problem, Canay (2011) proposed a simple transformation of the data that eliminate the individual fixed effects under the assumption that the fixed effects are constant across the diverse quantile levels. The combination of quantile regression models and panel data fixed effects models is widely regarded as an attractive option. It enables to kill two birds with one stone: in particular, to analyse the causal impact of covariates on the distribution of outcome variable while taking

into account some unobserved heterogeneity. We believe that the Carney (2011)'s model is effective enough to provide quantile treatment effects. Carney (2011) offers sufficient conditions under which the parameter of interest is detected for fixed *T* and indicates that there is a very simple transformation of the data while overcoming the fixed effects when they are seen as location shift variables (i.e., variables that exert similar impact under different quantile levels). To this end, the author proposed a two-step procedure. The first one consists of estimating the standard fixed effects panel data model at the conditional mean and then used the estimated parameters to find out the individual fixed effect ($\hat{\alpha}_i$). The second step consists of subtracting this component from the dependent variable and estimating using the standard quantile regression model ($\hat{Y}_{it} = \hat{\alpha}_i - Y_{it}$). In addition, the bootstrap method is performed to find out the variance– covariance matrix for this estimator. The regression also incorporates country dummies to deal with any remaining country-specific variation, whose omission could lead to irrelevant outcomes. Ultimately, year dummies are accounted for in order to effectively control for common time shocks to all countries.

Our empirical analysis considered permanent immigration inflows toward Europe by distinguishing between refugees or people fleeing war, violence and persecution in their home country (i.e., forced migration), and migrant workers or people seeking an improvement in their living standards (i.e., voluntary migration). Owing to the distinct features of refugee and economic migrants, a potential question is to test whether these differences have any economic implications. Finally, we ask whether migration in general (workers, refugees, family migrants, students, etc.) can have an impact on host countries through our variables of

interest. In this study, we consider two regressions: (1) the growth rate of real GDP per capita[5] (*rgdp*) on the different migrant groups (all migrants: *MF*, workers: *WF*, and refugees: *RF*) and potential control variables commonly considered to be the main determinants of economic growth, including the real GDP per capita(-1), the total investments as a percentage of GDP (*Inv*), the ratio of government expenditure to the GDP (*Gov*), the general government debt-to-GDP ratio (*Debt*) and the inflation rate measured by the consumer price index in terms of the annual growth rate (*Inf*) ; (2) the regression of unemployment rate (UR) on the three migrant groups (MF, WF and RF), the output gap (OG), the inflation rate (*Inf*), the real minimum wage (*RMW*), and the average tax wage (*TW*). The last two variables measure the extent to which tax on labour income and minimum wage affect the level of employment, while change in inflation can proxy for short-term macroeconomic situation. For more details, Bassanini and Duval (2007) discussed the status of the literature on the determinants of unemployment.

2.1.2. The endogeneity issue

Since both growth and employment can affect immigration, there is a potential endogeneity problem. This can occur when migrants are attracted by host countries that are enjoying current economic success (i.e., high economic growth or low unemployment rate). Also, there are some omitted variables in regression equations that might lead to a change in growth or employment and in inflow of migrants; this is the case of some characteristics of migrants like education and work experience. To control for possible endogeneity bias, there are many econometric tools including GMM, and instrumental variable (IV) regression. The application of GMM is mainly characterized by its high consistency in the presence of heteroskedasticity, but at a cost of poorer finite sample performance. However, if heteroskedasticity is absent, then IV estimator is much more preferable. Interestingly,

[6] The data set provides a wide range of data on people who moved (for reasons of work, family reunification, humanitarian protection or others); it also comprises other type of migration: people moving within areas of free circulation such as the European Union or the Southern Common Market.

standard GMM distribution theory requires differentiability of the moment functions. Differentiability is utilized in order to establish asymptotic normality by extending the sample moments. Nevertheless, there are huge estimation problems where the sample moments are non-differentiable or discontinuous. It must be stressed here that the asymptotic normality of sample quantiles cannot be achieved in the standard way due to the non-differentiability of the objective function. Hence, the inefficacy of GMM-based quantile regression. Therefore, our empirical approach takes the issue of the economic contribution of migration into account by performing an Instrumental Variable Quantile regression (IV-QR). The IV estimator is judged to be the most effective estimation technique to properly deal with endogeneity bias if the considered instruments are valid.

Note that almost by definition refugee inflows are exogenous along a number of indicators as the timing and the size of the inflows that depend at least partly on the exogenous conflicts and humanitarian crises in origin countries that motivated the exodus. But, in the case of European countries, one could think that the number of refugees as well as their distribution across the countries can be affected by local prospects and wage differences. Indeed, when refugees "cross the Rubicon", they feel safe and begin to think about the destination that best fits their aspirations. In particular, those refugees tend sometimes to settle in those regions/ countries that offer the most favorable economic opportunities. In the case of Germany for example, there is a noticeable spatial dimension in the distribution of refugees. In most districts of Eastern Germany, refugees and asylum seekers represented less than 7% of all job-seekers, while the country average was 10.5%. In a number of districts of Western Germany, this share reached more than 15%, especially in cities (OECD, 2018). Also, a measurement problem might generate substantial bias of analysis that might generate bias of the economic impact of refugees: skills that refugees acquired prior to the exodus may evaporate during the move (Borjas and Monras, 2017).

Throughout the rest of our investigation, an innovative instrument is employed, consisting of computing the share of the migrants going to others destination countries in the population of the European countries under study. By excluding the migration in the country in question, the variable is free of a direct causal link with the considered economic outcomes. But before controlling for possible endogeneity bias, this paper applies a relatively new test for the presence of endogeneity at each given conditional quantile level separately. While the issue of endogeneity in a quantile regression framework has long been known, and diverse econometric tools to efficaciously deal with this problem have been developed (inter alia: Amemiya, 1982; Powell, 1983; Kim and Muller, 2004; Ma and Koenker, 2006; Kim and Muller, 2013), very limited research focused on testing for the presence of endogeneity in conditional quantile models. Some studies indicated that the presence of endogeneity in either the conditional mean or a particular conditional quantile implies that the entire conditional distribution (i.e., all other conditional quantiles) is contaminated by endogeneity (Chen et al., 2003). But it seems more logical to presuppose that endogeneity can occur in only some parts of the conditional distribution of dependent variable. Even though a larger strand of literature applied the Hausman test for endogeneity analysis (see, for instance, Chmelarova and Hill, 2010; Lee and Okui, 2012), Kim and Muller (2013) contributed to this interest by developing a test to detect the presence of endogeneity across various quantiles, namely KM test.

The null hypothesis to be tested is:

H_0: There is no endogeneity in the τ^{th} quantile, which is equivalent to

$$H_0 : E(\psi_0(\mu_t)/\mathrm{Z}_t) = 0 \quad \text{for a given } \tau \tag{3}$$

where μ_t is the error term, and $\mathrm{Z}_t = [X_t, Y_t]$ with is the vector of exogenous variables, X_t and Y_t is the row vector of endogenous variables.

Testing this hypothesis aims at addressing how endogeneity at diverse quantile levels can be explained in a similar manner to what is pursued for the exogeneity notion generally employed in the least square estimation.

The Equation (3) for a given τ means that $E\left\{Y_t(\tau, I_{[\mu_t \prec 0]}\right\} = 0$, if it is believable that the only time series possibly yielding to an endogeneity bias is Y_t.

We used the 10% significance level to reject the null-hypothesis that there is no endogeneity conditioning upon the diverse economic circumstances of host countries (i.e., low or high economic growth) and the various nuances of unemployment (i.e., low or high levels).

2.2. Data and descriptive statistics

The currently available data on immigration by category covers the period 2003-2016 for the majority of European countries. They are indicated in the OECD's International Migration Database[6]. By considering similar time periods for all the considered variables, we only account for a panel of 10 countries (Belgium, Germany, Netherlands, France, UK, Italy, Spain, Denmark, Finland, and Sweden). We note that by restricting our analysis to these destination countries we reduce the likelihood that differences in the quality of institutions or other unobserved factors may operate as confounding factors. Table 1 provides details on the sources used to identify such variables and periods.

Table 1. Variables: definition, availability and data sources

Variables	Definition	Availability	Source
Rgdp	The growth rate of real GDP per capita	1970-2017	OECD : https://stats.oecd.org/index.aspx?DataSetCode=PDB_LV
UR	Unemployment rate: the number of unemployed people as a percentage of the labor force.	1953-2017	OECD : https://data.oecd.org/unemp/unemployment-rate.htm

[6] The data set provides a wide range of data on people who moved (for reasons of work, family reunification, humanitarian protection or others); it also comprises other type of migration: people moving within areas of free circulation such as the European Union or the Southern Common Market.

MF	The share of all migrants in the total population	1990-2016	OECD : https://stats.oecd.org/Index.aspx?QueryId=48877#
RF	The share of refugees in the total population	1990-2016	UNHCR: http://popstats.unhcr.org/en/persons_of_concern
WF	The share of migrant workers in the total population	2003-2016	OECD : https://data.oecd.org/migration/permanent-immigrant-inflows.htm
Inv	The total investments as a percentage of GDP	1985-2018	Quandl website: https://www.quandl.com/data/ODA/FRA_NID_NGDP-France-Total-Investment-of-GDP
Gov	The general government spending, as a share of GDP and per person.	1970-2017	OECD: https://data.oecd.org/gga/general-government-spending.htm
Debt	The general government debt-to-GDP ratio.	1995-2017	OECD: https://data.oecd.org/gga/general-government-debt.htm
Inf	The inflation rate.	1948-2018	OECD: https://data.oecd.org/price/inflation-cpi.htm
RMW	Real minimum wage	1990-2016	OECD: https://stats.oecd.org/Index.aspx?DataSetCode=RMW
TW	Average tax wage	2000-2017	OECD: https://stats.oecd.org/index.aspx?DataSetCode=AWCOMP
OG	The output gap: It is calculated as actual GDP less potential GDP as a percent of potential GDP.	1985-2017	Quand website : https://www.quandl.com/data/ODA/FRA_NGAP_NPGDP-France-Output-Gap-of-potential-GDP
Instrument 1	Inflows of foreign population by nationality	1990-2016	OECD: https://stats-3.oecd.org/Index.aspx?DataSetCode=MIG
Instrument 2	Refugee population by country or territory of asylum	1990-2016	The UN for Refugees Agency: https://data.worldbank.org/indicator/SM.POP.REFG

The descriptive statistics are displayed in Table 2. We show that mean series are higher relative to their standard deviations for most variables, which would imply significant trend in the data. The standard deviation values indicate that the growth rate of GDP per capita and the refugee and workers flows in percentage of the total population are more volatile than the migrant flows in percentage of total population, while the unemployment rate is likely to be less volatile. The considered variables are negatively skewed, implying that they have longer left tails of the normal distribution. All series appear platykurtic suggesting

that their distributions generate fewer extreme outliers than does a normal distribution. The Jarque-Bera (JB) test indicates that all the series under study deviate from the normal distribution. These considerations have motivated us to look at the quantile regression approach over ordinary least squares (OLS) regression.

Table 2. Descriptive statistics

	rgdp	*UR*	*MF*	*WF*	*RF*	*Inv*	*Gov*	*Debt*	*INF*	*OG*	*RMW*	*TW*
Mean	10.2187	-2.6183	-5.0585	-2.3507	-2.5427	3.2943	3.8905	4.3552	0.3271	0.2065	9.7372	3.7540
Median	10.6386	-2.5307	-4.9762	-2.34803	-2.6064	3.3600	3.8995	4.3656	0.5822	0.4350	9.9226	3.7657
Std. Dev.	1.41425	0.30757	0.4297	1.07769	0.78419	0.27931	0.0995	0.3504	0.8672	0.2640	0.3942	0.1815
Skewness	-2.7294	-0.9662	-0.1089	-0.80435	0.1018	-1.8012	-0.1714	-0.0152	-2.0057	-0.9248	-1.6134	-0.0786
Kurtosis	8.63332	3.99876	3.5168	3.54854	3.5880	5.7189	2.0914	2.0225	7.8748	3.9946	3.9830	1.7393
JB	248.700	11.5139	1.2717	11.6757	1.5656	82.3324	3.8113	3.8650	161.085	14.334	36.984	5.2455
Probability	0.0000	0.0031	0.5294	0.0029	0.4571	0.0000	0.1487	0.1447	0.0000	0.0007	0.0000	0.0726

3. Empirical results

As mentioned above, the quantile regression method makes it possible to examine the impacts of the independent variables on diverse quantiles of the growth and unemployment distributions instead of focusing on the mean of the distribution. Throughout this sub-section, we present the OLS and LAD (i.e., the 50^{th} quantile level) regression estimates to justify the utility of quantile regression analysis. We can attribute any contrast between the conditional median (LAD) and the mean (OLS) estimates to the asymmetry of the conditional density and to a strong effect exerted on the least squares fit by the possible outlier observations in the sample. Such different outcomes can confirm the efficacy of quantile regression analysis.

In addition, the present study tests the presence of endogeneity of immigration in each part of the conditional distribution of growth and unemployment and creates a "hybrid" model delivering exogenous and endogenous parts. It must be stressed at this stage that our study stands as a first attempt that tests the presence of an endogenous interaction between

immigration and host country economic conditions in various parts, which differs from the previous immigration literature. It thus offers more nuanced insights regarding the economic impacts of immigration. Finally, we test the robustness of our findings by increasing the size of our sample in order to verify whether extending the sample changes the story somewhat.

3.1. Baseline model

3.1.1. Immigration and growth

Before considering the two-stage estimation of the model we briefly describe some preliminary quantile regression results while treating immigration as exogenous. Table 3 presents the results for all migrants, workers migrants and refugees for different quantile levels (τ=0.25, 0.50, 0.75)[7]. Interestingly, we find that there is a non-negative e□ect of immigration on per capita growth, where this effect varies depending on the distribution of per capita growth. Particularly, all migrants exert a positive and pronounced impact on growth when the economic growth is middle or high (at middle and upper quantiles; for τ=0.50, 0.75). Also, economic migration has a positive impact on growth among countries with moderate or middle growth (at bottom and middle quantiles; for τ=0.25, 0.50), whereas refugees inflows affect positively the economic growth of the countries with lowest economic growth (at bottom quantiles; for τ=0.25). It must be pointed out that a variety of options are available for different coefficient covariance settings: using ordinary covariances, a Huber Sandwich technique, or a Bootstrap method[8].

[7] We focus on these quantile levels to keep our presentation simple and clearer. But more details can be provided for interested readers upon request.

[8] Several methods can be applied for computing scalar sparsity estimates. For ordinary or bootstrap covariances, Kernel (residual), or Siddiqui (residual) are usedHowever, when the covariance method is set to Huber Sandwich, only the Siddiqui (mean fitted) and Kernel (residual) methods are available. Throughout this analysis, we choose Bootstrap as the Coefficient Covariance, then select Kernel (residual) and Siddiqui (residual) to compute the scalar estimate of the sparsity. To ascertain the robustness of our results, the residual-based Huber Sandwich estimator is employed. The findings appear quite similar. In other words, the results are still fairly robust to distinct method of computing coefficient covariances and sparsity estimates. The Huber Sandwich and bootstrap standard errors are reasonably close. There are also relatively modest dissimilarities between the two sparsity estimates, with the Siddiqui (residual) estimator of the sparsity seems higher than Kernel (residual), but

The Koenker and Xiao (2002) test is performed to evaluate whether the estimated quantile regression relationships are conforming to the location shift hypothesis which assumes the same slope parameters for all of the conditional quantile functions. The rejection of the null hypothesis implies that the magnitude of the slope coefficient, estimated at the different parts of the conditional distribution, is different and that the difference is statistically significant favoring the panel quantile approach. In addition, A Wald test for the null hypothesis of equality of estimated coefficients across the different quantiles considered.[9] This test is proposed by Koenker (2005), and it is implemented here for the corresponding estimated coefficients resulting from the bootstrap procedure. It is shown that this test does not reject the null of equality of estimated coefficients across the various quantiles levels under consideration. This is valid for the different migration categories.

Table 3. Outcome variable: per-capita real GDP growth, the quantile regression estimates

Quantiles	τ=0.25	τ=0.50	τ=0.75	OLS	Koenker and Xiao test: OLS vs. QR	The wald test of equality	Number of observations
All migrants							
Estimate	0.4430	0.6705*	0.6904*	0.5537**	0.0009***	0.0000***	140
P-value	(0.9269)	(0.0646)	(0.0623)	(0.0123)			
Workers							
Estimate	0.1772*	0.0761**	0.1332	0.0123**	0.0041***	0.0013**	140
P-value	(0.0527)	(0.0381)	(0.1842)	(0.0056)			
Refugees							
Estimate	0.0831*	0.1980	-0.0550	0.1434	0.0013***	0.0009***	140
P-value	(0.0721)	(0.4965)	(0.6559)	(0.1094)			

(Notes) The Koenker and Xiao (2002) test assumes the same slope parameters for all of the concerned conditional quantile functions. ***, ** and * imply significance at the 1%, 5% and 10%, respectively.

We report the coefficients of the potential control variables included in the growth equation for various quantile levels (for τ=0.25, 0.50, 0.75) in Table 4. Not surprisingly, our findings showed that the share of investment to GDP has a positive and mostly significant impact on growth at different quantile levels. The hypothesis of absolute convergence is not

this difference has no substantive impact on the main outcomes. To keep our presentation clearer, detailed findings are available on request.

[9] The wald test is computed by means of the bootstrap variance-covariance matrix of the coefficients of interest. We thank the reviewer for pointing out this interesting suggestion.

validated in the countries under study. Convergence is already complete in most of these countries. The government expenditure as a share of GDP has a positive and significant impact on real economic growth rate at diverse quantiles. Public expenditure is traditionally seen as a stimulus for economic growth, having a significant counter-cyclical influence on fundamental economic variables as consumption and investment. Our results also indicate that high levels of the public debt-to-GDP ratio are likely to be deleterious for growth. An early literature (in particular, Modigliani 1961) claimed that the national debt is a burden for next generations, which comes in the form of a limited flow of income from a decreased stock of private capital. Inflation exerts a positive effect on growth, but this seems valid solely at upper quantiles. Inflation is largely under control in the countries under study. The latter are being tarnished by a low level of inflation that does not really weaken economic growth.

The rejection of the null hypothesis of Koenker and Xia (2002) test for all the considered control variables can be regarded as additional strong evidence in favor of the panel quantile regression over OLS.

Table 4. Outcome variable: per-capita real GDP growth, the quantile regression estimates, control variables

Quantiles	τ=0.25	τ=0.50	τ=0.75	OLS	Koenker and Xiao test: OLS vs. QR	The wald test of equality	Number of observations
All migrants							
C	-16.023*	-19.761***	-17.661***	-12.456***	0.0000***	0.0001***	
	(0.0688)	(0.0052)	(0.0010)	(0.0014)			
GDP(-1)	0.4445*	-0.0872	-0.0764	0.3214*	0.0061***	0.0000***	
	(0.0810)	(0.6402)	(0.6843)	(0.0515)			
INV	1.1460**	0.5020**	0.7331**	0.8104**	0.0003***	0.0009***	140
	(0.0052)	(0.0412)	(0.0039)	(0.0421)			
GOV	0.8674**	2.6053*	1.4447**	0.6972**	0.0014***	0.0011**	
	(0.0305)	(0.0523)	(0.0163)	(00351)			
DEBT	-0.4349*	-0.5856	-0.3445**	-0.2561*	0.0009***	0.0014**	
	(0.0648)	(0.1534)	(0.0083)	(0.0411)			
INF	-0.0810	0.1119**	0.2654**	-0.0512	0.0011***	0.0003***	
	(0.8968)	(0.0317)	(0.0188)	(0.2453)			
Workers							
C	-17.29**	-17.720**	-24.03***	-16.58**	0.0004***	0.0000***	
	(0.0062)	(0.0173)	(0.0001)	(0.0211)			
GDP(-1)	0.1345	0.3332*	0.0216	0.0412	0.0013***	0.0005***	
	(0.2763)	(0.0993)	(0.8962)	(0.2354)			
INV	2.2851**	1.1906*	-0.3351	1.2451*	0.0004***	0.0000***	140
	(0.0412)	(0.0723)	(0.6750)	(0.0718)			
GOV	0.8934**	1.0470**	-0.5178	0.7413**	0.0011***	0.0000***	

	(0.0195)	(0.04714)	(0.6916)	(0.0048)			
DEBT	0.1061**	-0.5593*	-0.1608**	-0.1452*	0.0009***	0.0010**	
	(0.0459)	(0.0874)	(0.0290)	(0.0823)			
INF	0.7108	0.3373	0.5267***	0.0521	0.0007***	0.0002***	
	(0.2487)	(0.4917)	(0.0001)	(0.3715)			
Refugees							
C	-26.04***	-26.04***	-23.499**	-22.414**	0.0010***	0.0009***	
	(0.0000)	(0.0000)	(0.0023)	(0.0056)			
GDP(-1)	0.6601*	0.0530	0.0659	0.2345*	0.0008***	0.0017**	
	(0.0434)	(0.7638)	(0.6837)	(0.0341)			
INV	1.0427***	0.3689*	0.3508**	0.6918*	0.0011***	0.0043**	
	(0.0087)	(0.0927)	(0.0069)	(0.0426)			140
GOV	0.2286*	0.9160	0.6065**	0.2153	0.0062***	0.0019**	
	(0.0866)	(0.5277)	(0.0363)	(0.2341)			
DEBT	0.0529	-0.3158**	-0.1479*	0.0567	0.0000***	0.0008***	
	(0.8762)	(0.0385)	(0.0829)	(0.5210)			
INF	0.0896	0.0066	0.1380*	0.0823	0.0009***	0.0001***	
	(0.2942)	(0.9892)	(0.0768)	(0.2456)			

(Notes) The Koenker and Xiao (2002) test assumes the same slope parameters for all of the concerned conditional quantile functions. ***, ** and * imply significance at the 1%, 5% and 10%, respectively.

3.1.2. Immigration and unemployment

The results displayed in Table 5 reveal a negative and statistically significant linkage between all migrants and unemployment, whatever the unemployment level (low: τ=0.25; middle: τ=0.50; or high: τ=0.75). The same is true for migrant workers, but only when the unemployment rate is low or near to the middle (for τ=0.25, 0.50). For refugees, we also note a negative impact on unemployment rate but solely when the unemployment rate is lower (τ=0.25).

Table 5. Outcome variable: Unemployment rate, the quantile regression estimates

Quantiles	τ=0.25	τ=0.50	τ=0.75	OLS	Koenker & Xiao test: OLS vs. QR	The Wald test of equality	Number of observations
All migrants							
Estimate	-0.1728*	-0.1541*	-0.1949*	-0.1672**	0.0023***	0.0012**	140
P-value	(0.0590)	(0.0792)	(0.0635)	(0.0351)			
Workers							
Estimate	-0.1061*	-0.0914*	-0.0387	-0.093***	0.0006***	0.0009***	140
P-value	(0.0871)	(0.0988)	(0.5362)	(0.0082)			
Refugees							
Estimate	-0.0420*	0.0089	-0.0192	-0.0761	0.0055***	0.0005***	140
P-value	(0.0965)	(0.8966)	(0.7400)	(0.4395)			

(Notes) The Koenker and Xiao (2002) test assumes the same slope parameters for all of the concerned conditional quantile functions. ***, ** and * imply significance at the 1%, 5% and 10%, respectively.

Regarding the additional control variables (Table 6), we note that the estimated coefficient of the output gap is statistically negative and significant at various quantile levels. Such outcome deeply highlights the prominence of cyclical unemployment patterns that can be attributed to macroeconomic shocks. Inflation contributes positively to unemployment for most quantiles. One element of explanation is that a period of high inflation generally discourages companies from investing. When inflation attains its highest level, companies are less certain investment will be profitable. Lower levels of investment could lead to higher unemployment in long-term horizons. Besides, if inflation raises, monetary authorities would tend to increase interest rates to limit inflationary pressures. A notable increase in interest rates can lead economic growth to collapse, yielding to recession and unemployment. Moreover, the minimum wage affects negatively the unemployment rate at various quantile levels for migrant workers and refugees: a higher minimum wage should favor remaining in the labor force and searching for jobs, while weaker employment prospects should instead lead to more inactivity[10]. Our findings also suggest that labour-market reforms can exert significant impact on unemployment. Specifically, we show that a cut in the tax wedge would be significantly associated with a decrease in the unemployment rate, consistently with Bassanini and Duval (2007). As for the effect of immigration on unemployment, the Koenker and Xiao (2002)'s test findings consistently provide evidence in favor of QR.

Table 6. Outcome variable: Unemployment rate, the quantile regression estimates, control variables

Quantiles	τ=0.25	τ=0.50	τ=0.75	OLS	Koenker and Xiao test: OLS vs. QR	The Wald test of equality	Number of observations
All migrants							
C	2.9630 (0.7851	4.1786** (0.0271)	4.3164* (0.0513)	-1.6192 (0.2764)	0.0000*** 0.0005***	0.0004***	

[10] Note that the minimum wage creates winners and losers in the labor market, depending on skill levels of workers. Among the pool of low-skilled workers, minimum wage allows employers to substitute more-skilled workers for the least-skilled workers. High-skilled workers are not directly affected by the minimum wage since market wages for high-skilled workers are typically well above the minimum wage (Zavodny, 2014).

INF	0.1276*	0.1350*	-0.0130	0.0456*	0.0016**	0.0013**	140
	(0.0961)	(0.0978)	(0.5678)	(0.0986)			
RMW	0.0085	-0.1036*	-0.1459*	-0.0613*	0.0023***	0.0011**	
	(0.9140)	(0.0456)	(0.0985)	(0.0981)			
TW	0.68***	0.2143**	0.5535**	0.2458*	0.0012***	0.0026**	
	(0.0007)	(0.0149)	(0.0194)	(0.0834)			
OG	-0.028*	-0.0041	0.0065	0.045		0.0034**	
	(0.0627)	(0.8544)	(0.7799)	(0.2355)			
Workers							
C	-5.3863*	-4.0548*	-2.7274	-4.2346*	0.0058***	0.0012**	
	(0.0981)	(0.0588)	(0.1555)	(0.0616)			
INF	0.1318*	-0.0070	0.0022	0.0456	0.0000***	0.0009***	
	(0.0865)	(0.8343)	(0.9420)	(0.3812)			
RMW	-0.1019**	-0.1523*	-0.0104	0.2314	0.0003***	0.0007***	140
	(0.0312)	(0.0696)	(0.9057)	(0.6243)			
TW	0.3917***	0.3506*	0.5128*	0.2456*	0.0000***	0.0001***	
	(0.0026)	(0.0744)	(0.0954)	(0.0451)			
OG	-0.1096*	0.0246	-0.1460*	-0.1325	0.0001***	0.0000***	
	(0.0962)	(0.4297)	(0.0502)	(0.4210)			
Refugees							
C	9.935***	7.1999***	5.8022**	7.8134*	0.0039***	0.0014**	
	(0.0000)	(0.0091)	(0.0083)	(0.0096)			
INF	0.087**	0.1172*	0.1275*	0.0543	0.0056***	0.0011**	
	(0.0054)	(0.0424)	(0.0369)	(0.2451)			
RMW	-0.0914*	-0.0067	0.0485	-0.1236*	0.0014***	0.0025**	140
	(0.0829)	(0.9477)	(0.6254)	(0.0782)			
TW	0.3674**	0.3998**	0.3756**	0.2946*	0.0008***	0.0017**	
	(0.0233)	(0.0316)	(0.0163)	(0.0613)			
OG	-0.034***	-0.0052	-0.0105**	-0.0671	0.0002***	0.0019**	
	(0.0098)	(0.8503)	(0.0176)	(0.1148)			

(Notes) ***, ** and * imply significance at the 1%, 5% and 10%, respectively.

Our results are quite interesting as they robustly show that the impact of immigration on growth is generally positive, and its impact on unemployment is negative. In particular, for all migrants, a positive (negative) linkage between migration and growth (unemployment) is shown when the growth or unemployment is low or high. But labor migration is optimal when the growth and unemployment is low or at the medium level and unemployment rate is low. On the other hand, the impact of refugee flows on economic growth (and unemployment) is positive (negative) and significant only when the growth and unemployment are relatively modest. These results suggest that there are realistic routes by which immigration can affect economic outcomes in European countries. Before drawing strong conclusions, we can't ignore the possibly endogeneity of immigration, in which case the estimates of immigration effects discussed previously may be biased. The next subsection discusses estimates of

immigration using an Instrumental Variable (IV) strategy. We begin by testing the existence of endogeneity in diverse parts of the conditional distribution of the dependent variables.

3.2. *Endogeneity test and "hybrid" model*

As mentioned above, the usual endogeneity tests based on means might fail to properly detect complex endogeneity features. The endogeneity test findings applied to Equation (3) for the growth function and for the different migration groups (all migrants, migrant workers, refugees) over the quantile grid from 0.25 to 0.75 are summarized in Table 7, and showed specific conditional distributions to be significantly affected by endogeneity. More precisely, for the relationship between all migrants (workers' migrants) and growth, the null hypothesis of no endogeneity can be rejected at the 10% when the growth is low or high (middle). Also, there exists evidence for the presence of endogeneity for the refugees and growth in the low quantile (τ=0.25) at the 10 % significance level. Table 7 also reports the endogeneity test outcomes for the unemployment function for each of the quantile index (τ= 0.25, 0.5, 0.75). Our findings indicate that the no endogeneity hypothesis is not rejected at low and middle quantiles for the relationship between all migrants and unemployment (τ=0.25, 0.50), and at middle quantile for workers and refugees at the 10 % significance level (τ=0.50).

Table 7. Endogeneity test

	per-capita real GDP growth			Unemployment rate				Number of observations
Quantiles	τ=0.25	τ=0.50	τ=0.75	Quantiles	τ=0.25	τ=0.50	τ=0.75	
All migrants P-value	0.0684	0.1163	0.0792	**All migrants** P-value	0.1261	0.1542	0.0813	140
Workers P-value	0.1034	0.0851	0.1537	**Workers** P-value	0.0967	0.1123	0.0742	140
Refugees P-value	0.0987	0.1462	0.1753	**Refugees** P-value	0.0669	0.1079	0.0384	140

(Notes): the null hypothesis tested is H_0: There is no endogeneity in the $\bar{\tau}^{th}$ quantile at the 10% significance level.

The results of this test indicate the endogeneity of immigrants' location choices for workers migrants and refugees in Europe. More interestingly, we can't assume, as some studies do it, that refugee supply is, by definition, exogenous, and therefore refugees might be attracted by some host countries with relatively less unemployment rate.

The use of KM test, which considers that endogeneity vary substantially across quantiles yielded to generate a "hybrid" model in which we mixed exogenous and endogenous parts. The idea here consists of keeping the classical quantile regressions (QR) results when there is exogeneity of migration and the IV-QR findings when there is endogeneity.

The results from the "hybrid" model for the growth function are presented in Table 8. As before considering the endogeneity problem, the positive and significant relationship between all migrants and the growth of GDP is also found when the economic growth is middle or high (for τ =0.50, 0.75). Also, the impact of labor migration on the growth of host countries appears significant when the economic growth is relatively moderate or fluctuating around the average (for τ = 0.25, 0.50). Refugees seem exert a positive and significant impact when the growth is low (for τ=0.25). Moreover, the coefficients associated to the control variables change very slightly when we control for the endogeneity problem found for some quantiles either in terms of sign or magnitude (see Appendix Table A1).

To confirm the validity of the considered instruments, a test suggested by Stock and Yogo (SY; 2005) is utilized to identify if there is a problem of weak instruments[11]. The null hypothesis of weak instruments was rejected, thus, weakness of instrument is of no concern.

Table 8. Outcome variable: per-capita real GDP growth, the hybrid regression estimates

Quantiles	τ=0.25	τ=0.50	τ=0.75	SY	Number of

[11] If F-statistic value is greater than the critical value provided by Stock and Yogo (2005), the null hypothesis of weak instruments can be rejected. 10 per cent and 15 per cent critical values of Stock–Yogo weak identification test (SY) are 17.02 and 13.85, respectively.

				τ=0.25	τ=0.50	τ=0.75	observations
All migrants	(a)	(b)	(a)				
Estimate	1.1994	0.6705*	0.6989*				140
P-value	(0.7159)	(0.0646)	(0.0804)	0.2561	-	0.1962	
Workers	(b)	(a)	(b)				
Estimate	0.1772*	0.1789**	0.1332				140
P-value	(0.0527)	(0.0431)	(0.1842)	-	0.1779	-	
Refugees	(a)	(b)	(b)				
Estimate	0.1357*	0.1980	-0.0550				140
P-value	(0.0744)	(0.4965)	(0.6559)	0.2618	-	-	

(Notes) ** and * imply significance at the 5% and 10%; SY: Stock–Yogo weak identification test. (a) IV-QR, (b) QR.

When controlling for endogeneity (Table 9), the results change slightly for the links between all migrants and unemployment, between migrant workers and unemployment, and between refugees and unemployment. Specifically, we usually show a negative impact of refugee inflows on unemployment when the unemployment is weak (for τ=0.25). For migrants workers, a negative impact is found solely when the unemployment is low (for τ=0.25). For all migrants, a negative linkage is shown when the unemployment is low or high (for τ=0.25; 0.75). The control variables' coefficients do not change substantially. For instance, we confirm that inflation and tax wage exert a positive impact on unemployment, whereas output gap and real minimum wage affect it negatively (see Appendix Table A2).

Table 9. Outcome variable: Unemployment rate, the hybrid regression estimates

Quantiles	τ=0.25	τ=0.50	τ=0.75	SY			Number of observations
				τ=0.25	τ=0.50	τ=0.75	
All migrants	(b)	(a)	(a)				
Estimate	-0.1728*	-0.1545	-0.1949*				140
P-value	(0.0590)	(0.7186)	(0.0635)	-	0.1682	0.1957	
Workers	(b)	(a)	(b)				
Estimate	-0.1061*	0.0864	-0.0387				140
P-value	(0.0871)	(0.7366)	(0.5362)	-	0.1549	-	
Refugees	(a)	(a)	(b)				
Estimate	-0.0401***	-0.0143	-0.0192				140
P-value	(0.0096)	(0.7765)	(0.7400)	0.2435	0.2118	-	

(Notes) ***, ** and * imply significance at the 1%, 5% and 10%, respectively; SY: Stock–Yogo weak identification test. (a) IV-QR, (b) QR.

3.3. Sensitivity analysis

In this section, we check whether the economic effects of immigration shown before are robust to any sample restriction. The available data on economic migration covers only the years 2003-2016 while the observed data on both flows of all types of migration and refugee are available over the 1990-2016 period. This would allow us to analyze the impact of each of them on growth and unemployment over the extended period 1990-2016. The main findings are reported in Tables 10 and 11. It should be noted that we retain only the results of the hybrid regression estimates to keep the clarity of our presentation. Table 10 displays the endogeneity test findings for growth and unemployment functions. Our results reveal that the null hypothesis that there is no endogeneity is not rejected at low quantile for both the linkages between all migrants and growth (τ=0.25), and between refugees and growth (τ=0.25). For the unemployment function, the null hypothesis is not supported at middle quantile (τ=0.50) for all migrants, whereas evidence for the presence of endogeneity for the refugees and unemployment is validated in the middle and upper quantile levels (τ=0.25, 0.50) at the 10 % significance level.

Table 10. Endogeneity test, 1990-2016

	per-capita real GDP growth			Unemployment rate			
Quantiles	τ=0.25	τ=0.50	τ=0.75	Quantiles	τ=0.25	τ=0.50	τ=0.75
All migrants P-value	0.0911	0.1073	0.1345	**All migrants** P-value	0.1077	0.0431	0.1196
Refugees P-value	0.0843	0.1162	0.1217	**Refugees** P-value	0.0515	0.0826	0.1324

(Notes): the null hypothesis tested is H_0: There is no endogeneity in the τ^{th} quantile at the 10% significance level.

The results for 1990-2016 are similar to those for the short period reported in Tables 8 and 9, again offering robust evidence of a positive relationship between all migrant groups and GDP per capita growth (for τ=0.50, 0.75), and a negative link between migration and unemployment. For refugees the results also do not change. Similarly, the coefficients

associated to the control variables remain solid for both the growth and unemployment functions (See Appendix Tables A3 and A4, respectively).

Table 11. Outcome variable: per-capita real GDP growth, the hybrid regression estimates, 1990-2016

Quantiles	τ=0.25	τ=0.50	τ=0.75	SY			Number of observations
				τ=0.25	τ=0.50	τ=0.75	
All migrants	(a)	(b)	(b)				270
Estimate	0.7562	0.5823***	0.5472***				
P-value	(0.3422)	(0.0006)	(0.0038)	0.1823	-	-	
Refugees	(a)	(b)	(b)				270
Estimate	0.1283***	0.1625**	0.0961				
P-value	(0.0074)	(0.0311)	(0.2423)	0.2145	-	-	

(Notes) ***, ** and * imply significance at the 1%, 5% and 10%, respectively; SY: Stock–Yogo weak identification test. (a) IV-QR, (b) QR.

Table 12. Outcome variable: Unemployment rate, the hybrid regression estimates, 1990-2016

Quantiles	τ=0.25	τ=0.50	τ=0.75	SY			Number of observations
				τ=0.25	τ=0.50	τ=0.75	
All migrants	(b)	(a)	(b)				270
Estimate	-0.2024***	-0.0873	-0.146***				
P-value	(0.0018)	(0.4461)	(0.0000)	-	0.2256	-	
Refugees	(a)	(a)	(b)				270
Estimate	-0.1005**	-0.0872	-0.0452				
P-value	(0.0422)	(0.3415)	(0.2381)	0.1942	0.2304	-	

(Notes) ***, ** and * imply significance at the 1%, 5% and 10%, respectively; SY: Stock–Yogo weak identification test. (a) IV-QR, (b) QR.

4. Conclusion

At a time when popular and policymakers in parts of Europe (and in United States) present immigration as an economic and social drain or a security threat, it is vital to investigate the impact of (forced and economic) migrations on the hosting economy as many of the key issues in the immigration policy debate are economic. In this study, we use a panel quantile regression model to examine the distributional relationship between immigration to Europe and some economic outcomes (in particular, economic growth and unemployment rates). We use instrumental variable method to correct for the bias induced by endogenous

immigration and generate a newly "hybrid" model mixing exogenous and endogenous parts of the distribution of growth and unemployment.

Our results confirm the benefits associated with the immigration inflows. Specifically, we robustly show a positive relationship between migration and economic growth and find that migration flows do not increase unemployment, on the contrary it reduces it even if all these effects seem sensitive to the considered quantile or the economic outcome of the countries under study. Such findings are consistent with empirical results from some international research indicating the positive impacts of immigration on the host population through provision of skills currently unavailable or engagement in entrepreneurial activities that provide opportunities to residents. Also, one could think that immigrants who have high levels of productivity and who adapt rapidly to conditions in the host country's labor market can make a significant contribution to economic growth (Borjas, 1994).

Thus, it is suitable to talk about the "gains from immigration" in terms of labor market and the prospects of economic growth. Accordingly, the fear of European countries of the economic impact that migrants and refugees could have on their economic wellbeing is not deeply justified and sometimes exaggerated in particular when it touches the respect for humanitarian and moral imperatives. In case of refugees for example, their inflow is very limited compared to the influx of refugees toward countries such as Lebanon and Jordan which hosting them at the expense of their already stressed national systems and public finances. Since the aftermath of the Arab Spring, Lebanon with a population of 4.5 million people, has been hosted more than 1.2 million Syrians refugees, nearly 30 percent of Lebanon's population (World Bank, 2016). This migration crisis has added a major strain on Lebanon's economy and infrastructure and economic issues that pre-date the Syrian crisis have become more pronounced – among them youth unemployment and one of the highest debt-to-GDP ratios in the world. Lebanon and Jordan have also shown surprising social and

political resilience in accommodating numbers of refugees that would strain the boundaries of sociopolitical acceptability in much wealthier and more stable Western European countries, where hosting a much smaller number of refugees has evoked a significant political backlash.

5. Policy recommendations

The findings in this paper imply that there are realistic routes by which immigration can affect economic outcomes in European countries. Informing public opinion in this regard might influence attitudes towards immigration and discrimination practices; this seems a relevant policy recommendation. On the other hand, the complexity of migration requires a global approach to policies in Europe. Some studies highlight the low geographical mobility of European workers as central in many explanations of unemployment whereas the mobility of migrants workers within the same host country or across European countries, in response to regional economic differences in labor market opportunities, is high (David et al., 2010, Røed and Schøne, 2012). This indicates that migration helps address labour market imbalances. Also, when choosing where migrants may settle, it seems quite prominent to consider where appropriate jobs that match their skills can be found based on their profile such as their education level and work experience. Concerning refugees, in several countries, the programming for resettled refugees is often short-term, and the measures that aim to ease their integration into the labor market do not take into account the particularity of refugees by considering whether the goal is short or long-term integration. Also, the economic integration of refugees can be harmed by the legal constraints since there are restrictions on taking up work during the asylum application. The rapid labor market integration is also a key to reducing the net fiscal cost associated with welcoming refugees.

Moreover, the implementation of European immigration policy requires taking into account the factors that attract migrants into the destination country. An example of such

factors is the labour market condition in host countries that could considerably influence the policy efficiency. The severeness or the benevolence of this policy should be, at least, coordinated with the economic and social capacity of each European country, the degree of information dissemination in the society, and its level of anti-immigrant sentiment. Many European countries experience high levels of anti-immigrant opinions and poor sociopolitical acceptability of migrants.

Before ending, we want to point out that the recent refugee crisis was a wake-up call to undertake the required coordination for great future challenges. With the climate change, the political instability, and the continued conflicts in many home countries, migration pressures on Europe seem likely to increase further over the coming decades.

References

Alloush M, Gonzalez E, Gupta A, Rojas IR, and Taylor J.E. (2016). Economic life in a refugee camp. Available at: migrationcluster.ucdavis.edu/events/seminars_2015-2016/alloush/paper_alloush.pdf.

Amemiya, T., (1982). Two Stage Least Absolute Deviations Estimators. Econometrica, 50, 689-711.

Angrist, J.D. and Kugler, A.D. (2003). Protective or counter-productive? Labour market institutions and the effect of immigration on EU natives? Economic Journal, 113(488), 302-331.

Bassanini, A. and Duval, R. (2007). The Determinants of Unemployment across OECD Countries: Reassessing the Role of Policies and Institutions. OECD Economic Studies, 7-86.

Bevelander, P. (2016). Integrating refugees into labor markets. IZA World of Labor, 269 doi: 10.15185/izawol.269.

Binder, M., and Coad, A. (2011). From Average Joe's happiness to Miserable Jane and Cheerful John: Using quantile regressions to analyze the full subjective well-being distribution. Journal of Economic Behavior & Organization, 79(3), 275–290.

Borjas, G.J. (1994). The Economics of Immigration. Journal of Economic Literature, 22, 1667-1717

Borjas, G.J., and Monras, J. (2017). The labor market consequences of refugee supply shocks. Economic Policy, 32(91), 361-413

Boubtane, E., Coulibay, D., and Rault, C., (2013). Immigration, growth, and unemployment: Panel VAR Evidence from OECD Countries. Labour 27 (4), 399–420.

Canay, I. A., (2011). A simple approach to quantile regression for panel data. The Econometrics Journal, 14(3), 368–386.

Card, D., (2001). Immigrant inflows, native outflows, and the local labor market impacts of higher immigration. Journal of Labor Economics 19(1), 22–64.

Card, D., (2007). How immigration affects U.S. cities. University College London, Centre for Research and Analysis of Migration Discussion Paper n°11/07.

Chen, X., Linton, O., Van Keilegem, I., (2003). Estimation of Semi-parametric Models When the Criterion Function is not Smooth. Econometrica, 71, 1591-1608.

Chmelarova, V., Hill, R.C., (2010). The Hausman Pretest Estimator. Economics Letters, 108, 96-99.

Clemens, M., and Hunt, J., (2017). The labor market effects of refugee waves: reconciling conflicting results. IZA DP n° 10806. Available at: http://ftp.iza.org/dp10806.pdf

Costa-Lascoux, J., (1987). Insertion sociale des réfugiés et demandeurs d'asile en Europe. Revue européenne des migrations internationales, 3(3), 151-168.

D'Albis, H ,Boubtane, E and Coulibaly, D., (2018). Macroeconomic evidence suggests that asylum seekers are not a "burden" for Western European countries. Sciences Advances 4(6), DOI: 10.1126/sciadv.aaq0883

David, Q., Janiak, A., Wasmer, E (2010). Local social capital and geographical mobility. Journal of Urban Economics, 68 (2), 191-20

Dustmann, C., Fabbri, F. and Preston, I. (2005). The impact of immigration on the British labour market. The Economic Journal, 115(507), 324-341.

Frigoli, G., and Jannot, J., (2004). Travail social et demande d'asile: les enseignements d'une étude sur l'accueil des demandeurs d'asiledans les Alpes-Maritimes. Revue française des affaires socials, 4, 223-242.

Glitz, A., (2012). The labor market impact of immigration: A quasi-experiment exploiting immigrant location rules in Germany. Journal of Labor Economics, 30(1),175–213.

Hunt, J., (1992). The impact of the 1962 repatriates from Algeria on the French labor market. Industrial & Labor Relations Review, 45(3), 556-572.

International monetary fund, (2016). The Refugee Surge in Europe: Economic Challenges. IMF Staff Discussion Note/16/02

Jaumotte, F., Koloskova K., and Saxena S., (2016). Impact of migration on income levels in advanced economies. IMF Spillover notes 8, International Monetary Fund, Washington, DC.

Jean, S., and Jimenez, M. (2007). The unemployment impact of immigration in OECD Countries. OECD Economics Department Working Paper n° 563.

Kato, K., and Galvao, A. F. (2010). Smoothed quantile regression for panel data. Discussion paper, University of Iowa.

Kim, T-H., and Muller, C., (2004). Two-stage Quantile Regressions When the first Stage is Based on Quantile Regressions. The Econometrics Journal, 7, 218–231.

Kim, T-H., and Muller, C., (2013). A Test for Endogeneity in Conditional Quantiles. Working paper, University of Aix-Marseille. Available at: https://www.amse-aixmarseille.fr/sites/default/files/_dt/2012/wp_2013_-_nr_42.pdf

Koenker, R., and Hallock, K. F. (2001). Quantile regression. Journal of Economic Theory, 15, 143–156.

Koenker, R. and Xiao, Z., (2002). Inference on the quantile regression process. Econometrica, 81, 1583–1612.

Koenker, R. and Bassett, G., (1978). Regression quantiles. Econometrica 46 (1), 33-50.

Lancaster, T. (2000). The incidental parameter problem since 1948. Journal of Econometrics, 95(2), 391–413.

Lee, Y., and Okui, R., (2012). Hahn-Hausman Test as a Specification Test. Journal of Econometrics, 167, 133–139.

Ma, L., R. and Koenker, (2006). Quantile Regression Methods for Recursive Structural Equation Models. Journal of Econometrics, 134, 471–506.

Métral, A., and Padovani, E., (2016). L'insertion professionnelle des refugiées: Une nécessité qui rencontre des obstacles. Note d'analyse, RSE &Diversité, December.

Modigliani, F. (1961). Long-run implications of alternative fiscal policies and the burden of the national debt. The Economic Journal, 71(284), 730–755.

OCDE (2016). International Migration Outlook. Perspectives des Migrations Internationales 2016, available at DOI : 10.1787/migr_outlook-2016-fr

OECD (2018). International Migration Outlook 2018. DOI:https://doi.org/10.1787/migr_outlook-2018-en

Ortega, J., and Verdugo, G., (2014). The impact of immigration on the French labor market: Why so different? Labour Economics, 29, 14–27.

Ortensi, E.L. (2015). The Integration of Forced Migrants Into the Italian Labor Market. Journal of Immigrant & Refugee Studies 13(2): Immigration and Civil Society

Papademetriou, D. G., Sumption, M., and Somerville, W., (2009). Migration and the economic downturn: what to expect in the European Union. Washington DC, Migration Policy Institute.

Peri, G., and Sparber, C., (2009). Task specialization, immigration, and wages. American Economic Journal: Applied Economics, 1(3), 135–169.

Peri, G., (2010). The effect of immigrants on U.S. employment and productivity. FRBSF Economic Letter n°26.

Pischke, J., and Velling, J. (1997). Employment effects of immigration to Germany: an analysis based on local labor markets. Review of Economics and Statistics, 79(4), 594-604.

Powell, J., (1983). The Asymptotic Normality of Two-Stage Least Absolute Deviations Estimators. Econometrica, 51, 1569–1575.

Røed, M., and Schøne, P., (2012). Does immigration increase labour market flexibility? Labour Economics, 19 (4), 527–540.

Simon, J.L., Moore, S. and Sullivan, R. (1993). The effect of immigration on aggregate native unemployment: an across-city estimation. Journal of Labor Research, 14(3), 299-316.

Smith, C., (2012). The impact of low-skilled immigration on the youth labor market. Journal of Labor Economics 30(1), 55–89.

Stock, J. H., and Yogo, M., (2005). Testing for Weak Instruments in Linear IV Regression. Available at : http://mayoral.iae-csic.org/IV_2015/stock_yogo_2005.pdf

Werker, E., (2007). Refugee camp economies. Journal of Refugess Studies, 20(3), 461–480.

Whitaker, B.E. (2002). Refugees in western Tanzania: The distribution of burdens and benefits among local hosts. Journal of Refugee Studies 15(4), 339–358

Weber, E., and Weigand, R., (2016). Identifying macroeconomic effects of refugee migration to Germany. IAB Discussion Paper n° 20, available at: http://doku.iab.de/discussionpapers/2016/dp2016.pdf

World Bank. (2016). World Bank Group engagement in situations of fragility, conflict, and violence: an independent evaluation. Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/913951470320355184/World-Bank-Group-engagement-in-situations-of-fragility-conflict-and-violence-an-independent-evaluation

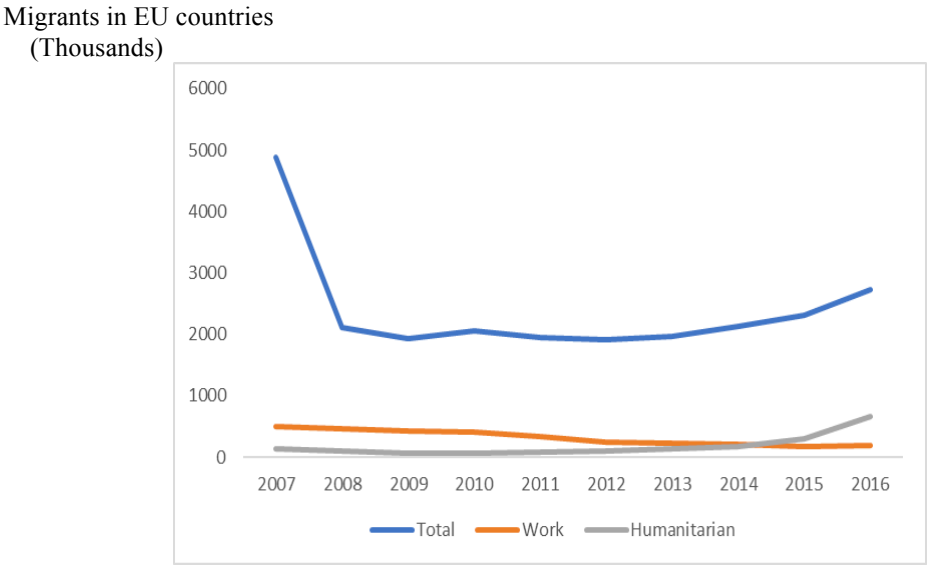
You, W., Zhu, H., and Yu, K., (2015). Democracy, Financial Openness, and Global Carbon Dioxide Emissions: Heterogeneity Across Existing Emission Levels. World Development 66, 189–207.

Zavodny, M. (2014). Who benefits from the minimum wage–natives or migrants? IZA World of Labor, 98.

Appendix

Figure A1. Refugees and migrants in Europe

The number of persons who moved for reasons of work and humanitarian protection is still lower compared to other forms of immigration



Source: OECD database
Countries considered: Austria, Belgium, Danmark, Finland, France, Germany, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, United Kingdom

Table A1. Outcome variable: per-capita real GDP growth, the hybrid regression estimates, control variables, 2003-2016

Quantiles	τ=0.25	τ=0.50	τ=0.75	Number of observations
All migrants	(a)	(b)	(a)	
C	-15.1612***	-	-16.557***	
	(0.0059)	14.8403**	(0.0040)	
GDP(-1)	-0.4304*	(0.0129)	-0.0764	
	(0.0830)	-0.0872	(0.6843)	
INV	2.2842*	(0.6402)	0.7331***	140
	(0.0942)	0.5020*	(0.0039)	
GOV	3.9473*	(0.0412)	1.4447**	
	(0.0990)	2.6053**	(0.0163)	
DEBT	-0.3535	(0.0523)	-0.3445***	
	(0.4651)	-0.5856	(0.0083)	
INF	-0.0363	(0.1534)	0.2654**	
	(0.9214)	0.1119**	(0.0188)	
		(0.0317)		
Workers	(b)	(a)	(b)	
C	-15.406***	-16.1084	-19.9085	
	(0.0008)	(0.3629)	(0.1113)	
GDP(-1)	0.1345	0.5446**	0.0216	
	(0.2763)	(0.0237)	(0.8962)	
INV	2.2851*	0.9291*	-0.3351	140
	(0.0412)	(0.0717)	(0.6750)	
GOV	0.8934**	0.3336	-0.5178	
	(0.0195)	(0.8915)	(0.6916)	
DEBT	0.1061**	0.1439	-0.1608**	
	(0.0459)	(0.8297)	(0.0290)	
INF	0.7108**	0.3294***	0.5267***	
	(0.0487)	(0.0004)	(0.0001)	
Refugees	(a)	(b)	(b)	
C	-13.3362**	-11.76***	-12.84***	
	(0.0046)	(0.0000)	(0.0000)	
GDP(-1)	-0.3481	0.0530	0.0659	
	(0.2965)	(0.7638)	(0.6837)	140
INV	2.2721***	0.3689*	0.3508***	
	(0.0068)	(0.0927)	(0.0069)	
GOV	3.2921*	0.9160	0.6065**	
	(0.0749)	(0.5277)	(0.0363)	
DEBT	-0.3427*	-0.3158**	-0.1479*	
	(0.0913)	(0.0385)	(0.0829)	
INF	0.0731	0.1380*	0.0066	
	(0.8704)	(0.0768)	(0.9892)	

(Notes) ***, ** and * imply significance at the 1%, 5% and 10%, respectively. (a) IV-QR (b): QR.

Table A2. Outcome variable: Unemployment rate, the hybrid regression estimates, control variables, 2003-2016

Quantiles	τ=0.25	τ=0.50	τ=0.75	Number of observations
All migrants	(b)	(a)	(b)	
C	11.415***	11.654***	12.4713***	
	(0.0000)	(0.0000)	(0.0000)	
INF	0.1276*	0.1030*	-0.0130	
	(0.0961)	(0.0956)	(0.5678)	
RMW	0.0085	-0.0308	-0.1459*	140
	(0.9140)	(0.6533)	(0.0985)	
TW	0.6897***	0.3629*	0.5535**	
	(0.0007)	(0.0939)	(0.0194)	
OG	-0.0287*	0.0036	0.0065	
	(0.0627)	(0.8839)	(0.7799)	
Workers	(b)	(a)	(b)	
C	-2.6657	-3.1261**	-2.6842	
	(0.2944)	(0.0481)	(0.3912)	
INF	0.1318*	0.2109*	0.0022	
	(0.0865)	(0.0602)	(0.9420)	
RMW	-0.1019**	-0.3042***	-0.0104	140
	(0.0312)	(0.0040)	(0.9057)	
TW	0.3917***	0.2339*	0.5128*	
	(0.0026)	(0.0537)	(0.0954)	
OG	-0.1096*	-0.0172	-0.1460*	
	(0.0962)	(0.5251)	(0.0502)	
Refugees	(a)	(a)	(b)	
C	-1.4067	-2.1592	-1.2037***	
	(0.4974)	(0.3206)	(0.0022)	
INF	0.1625*	0.1367*	0.1275**	
	(0.0835)	(0.0904)	(0.0369)	
RMW	-0.3420*	0.0799	0.0485	140
	(0.0608)	(0.3208)	(0.6254)	
TW	0.7451*	0.3264*	0.3756**	
	(0.0286)	(0.0819)	(0.0163)	
OG	-0.0330	-0.0004	-0.0105	
	(0.3260)	(0.9869)	(0.7176)	

(Notes) ***, ** and * imply significance at the 1%, 5% and 10%, respectively. (a) IV-QR (b): QR.

Table A3. Outcome variable: per-capita real GDP growth, the hybrid regression estimates, control variables, 1990-2016

Quantiles	τ=0.25	τ=0.50	τ=0.75	Number of observations
All migrants	(a)	(b)	(b)	
C	-22.145***	-21.35***	-19.84***	
	(0.0000)	(0.0000)	(0.0003)	
GDP(-1)	-0.1523	-0.1325**	-0.0561*	
	(0.2546)	(0.0410)	(0.0932)	270
INV	0.9134***	0.2151	0.5249	
	(0.0058)	(0.3347)	(0.1521)	
GOV	1.5213	1.9726***	1.4447**	

	(0.2341)	(0.0095)	(0.0163)	
DEBT	-0.3535	-0.3427	-0.3284**	
	(0.4651)	(0.2856)	(0.0269)	
INF	0.0952***	0.1023	0.1109**	
	(0.0054)	(0.2561)	(0.0100)	
Refugees	(a)	(b)	(b)	
C	-19.882**	-21.342***	-	
	(0.0155)	(0.0074)	18.776***	
GDP(-1)	-0.3351	-0.3019	(0.0019)	
	(0.1943)	(0.4631)	0.1792*	
INV	0.9214***	0.6152***	(0.0995)	
	(0.0005)	(0.0003)	0.7134***	
GOV	0.6752***	0.7233***	(0.0052)	270
	(0.0094)	(0.0087)	0.7122***	
DEBT	-0.2972**	-0.2144	(0.0080)	
	(0.0105)	(0.1575)	-	
INF	0.1145*	0.1092	0.2341***	
	(0.0515)	(0.1652)	(0.0089)	
			-0.1421	
			(0.5029)	

(Notes) ***, ** and * imply significance at the 1%, 5% and 10%, respectively. (a) IV-QR (b): QR.

Table A4. Outcome variable: Unemployment rate, the hybrid regression estimates, control variables, 1990-2016

Quantiles	τ=0.25	τ=0.50	τ=0.75	Number of observations
All migrants	(b)	(a)	(b)	
C	7.3651***	8.5214***	7.9935***	
	(0.0051)	(0.0009)	(0.0003)	
INF	0.1145***	0.1146***	0.0789*	
	(0.0089)	(0.0081)	(0.0910)	270
RMW	-0.1521**	-0.1142*	-0.1073***	
	(0.0325)	(0.0718)	(0.0082)	
TW	0.4136***	0.2510	0.2344	
	(0.0051)	(0.1462)	(0.1194)	
OG	-0.0111**	0.0235	-0.0154	
	(0.0276)	(0.4327)	(0.1039)	
Refugees	(a)	(a)	(b)	
C	-0.9872	-3.4218*	-4.1195**	
	(0.5010)	(0.0912)	(0.0110)	
INF	0.1233***	0.1178***	0.1093**	
	(0.0084)	(0.0067)	(0.0112)	
RMW	-0.1679***	0.1046**	0.1538**	270
	(0.0041)	(0.0208)	(0.0310)	
TW	0.3218***	0.2678***	0.3094**	
	(0.0094)	(0.0076)	(0.0106)	
OG	-0.0912*	-0.0345	-0.0461	
	(0.0734)	(0.6751)	(0.5983)	

(Notes) ***, ** and * imply significance at the 1%, 5% and 10%, respectively. (a) IV-QR (b) QR.