

1 Introduction

Free movement of workers is, together with free movement of goods, capital and services, one of four fundamental freedoms of the common EU market postulated in the Treaty of Rome in 1957. In the short-run, it may help in reducing region-specific labor market pressures (as famously argued by Mundell (1961) in the context of optimal currency areas). However, as the recent history of the EU integration has shown, the features of labor flows that emerge after a reduction of the barriers to workers' mobility can differ from those exhibited by the movement of employees that dampens the short-run unemployment differentials as postulated in Mundell (1961). More specifically, large and long-lasting labor migrations may result from persistent heterogeneity across regions comprising the common market. An important example of such processes were flows of workers that started after the EU enlargements in 2004, 2007 and 2013 - i.e. after the accession of 11 Central and Eastern European countries (CEE), Malta and Cyprus.¹ The opening of borders together with large cross-country differences in the standards of living (measured with consumption per capita) led to massive migrations from the new member states to the so-called "Old Europe" (democratic European countries before the fall of communism).² This pattern is displayed in the top-left panel of Figure 1, which plots the net rates of the intra-EU migrations against the levels of consumption per capita.³ Indeed, as the example of a country that was most severely affected by the outflow of emigrants (i.e. Romania) shows, large movements of workers from poorer EU states were tightly related to the elimination of the mobility barriers after the EU accession: the average annual number of Romanian citizens leaving their country after the accession was more than 20 times larger than before the accession.⁴

An important feature of the intra-EU migrations is that the age structures of the populations of emigrants and stayers are different. In particular, the share of the working-age cohorts in the population of emigrants is significantly larger than the corresponding share in the group of stayers (see the bottom-left panel of Figure 1). This pattern becomes even more

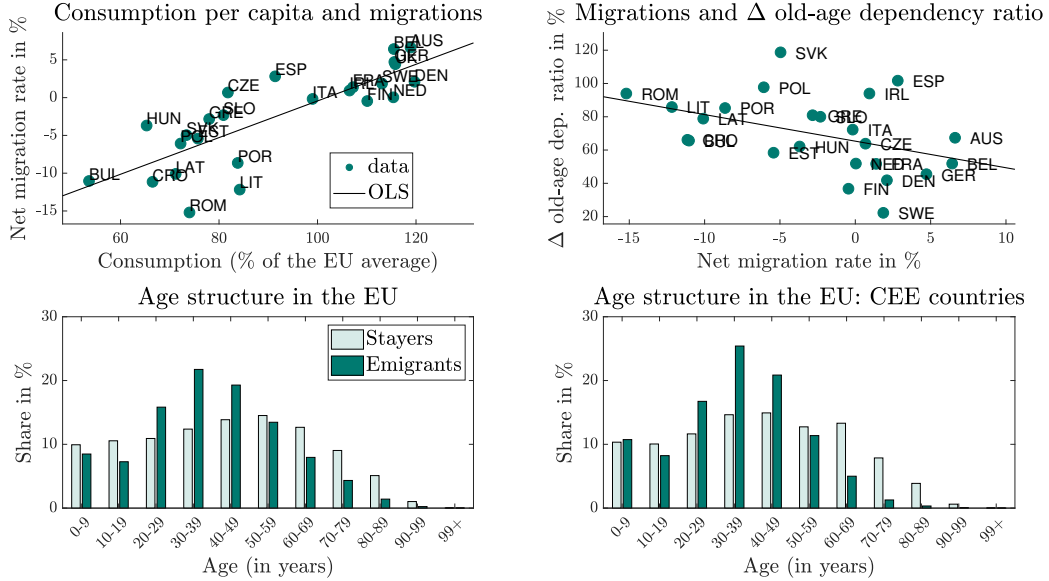
¹The countries that became EU members in 2004 were: Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia. Romania and Bulgaria became the member states in 2007 while Croatia joined the EU in 2013.

²Except for the CEE member states, the net migration rates were negative for several countries that were severely and persistently affected by the Global Financial Crisis and the Sovereign Debt Crisis (such as Greece, Italy and Portugal).

³Throughout the paper we use the following abbreviations: BEL - Belgium, BUL - Bulgaria, CZE - Czechia, DEN - Denmark, GER - Germany, EST - Estonia, IRL - Ireland, GRE - Greece, ESP - Spain, FRA - France, CRO - Croatia, ITA - Italy, LAT - Latvia, LIT - Lithuania, HUN - Hungary, NED - the Netherlands, AUS - Austria, POL - Poland, POR - Portugal, ROM - Romania, SLO - Slovenia, SVK - Slovakia, FIN - Finland, SWE - Sweden, UK - United Kingdom.

⁴Averages computed for two periods 2003-2007 and 2008-2009 based on the UN dataset "International Migration Flows to and from Selected Countries: The 2015 Revision".

Figure 1: The intra-EU migrations in 2019



Source: EUROSTAT data on EU and EFTA citizens who are usual residents in another EU/EFTA country, final consumption expenditure per capita (based on purchasing power standards), Δ old-age dependency ratio measures the change of that indicator between 2019 and its projected level in 2050 in percent. Net migration rate is the standardized difference between the number of citizens from other EU countries living in a given country and the number of its citizens who emigrated to other EU countries (this resulting number is standardized by the number of citizens of a given country). We do not report Malta and Cyprus due to the unavailability of migrations data. Luxembourg is excluded as an outlier (the key driver of the net migration rate of 61% is the employment of other EU citizens by EU institutions established in Luxembourg). UK is not reported in the top-right panel due to the unavailability of the data on the projected old-age dependency ratio.

pronounced for the CEE countries (see the bottom-right panel of Figure 1).

The character of the intra-EU flows (their magnitude, persistence and their structure discussed above) poses significant threats for the sustainability of fiscal policy conducted independently by national governments in countries featuring negative net migration rates.⁵ The outflow of the working-age population mechanically increases the old-age dependency ratio. Moreover, as some migrants settle and give birth to the next cohorts of future workers in the countries of destination, this effect is likely to persist over time.⁶ To illustrate this long-lasting impact, the top-right panel of Figure 1 displays the negative relationship between the net migration rates in 2019 and the projected change in the old-age-dependency ratio between 2019 and 2050.⁷ Higher old-age dependency ratio implies lower share of labor force in

⁵In our analysis, “fiscal policy which is conducted independently by national governments” means that there is no government budget consolidated at the EU level.

⁶Although the populations of the CEE countries are currently younger than the populations in the “Old Europe”, the aging process projected for the CEE region is quicker than in Western Europe. As argued in Batog et al. (2019) (which is the recent IMF report on the impact of demographic situation in the CEE countries on their economic performance), is the main factor exacerbating the aging dynamics in those countries.

⁷More specifically, according to the OLS model estimated on the reported data points, a rise in the value of net migration rate by one percentage point lowers the expected change in the old-age dependency ratio by about 1.6 percentage points.

the population, which automatically lowers GDP per capita. Additionally, for the politico-economic reasons, the rise of the ratio between old and young puts national governments under pressure to redistribute more resources towards the elderly as their bargaining power increases. As a result, the share of age-related spending and public services (like healthcare) in GDP may rise considerably. Additional fiscal costs can be accommodated either through higher taxes or public debt-issuance. The former type of fiscal reaction may reduce demand, lower employment incentives and induce additional outflows of workers (which gives rise to a reinforcing loop between migrations and fiscal policy). The latter type of accommodation may increase public debt, raise sovereign debt premium and debt-service costs. Another, somewhat more mechanical, aspect of the interplay between debt and outflows was discussed by Brunnermeier et al. (2016): “(...) *When productive and innovative people abandon their country, the debt has to be paid off by a smaller, less productive, aging population. In a sense, individual citizens have an option to walk away from their government debt obligation by leaving the country. Emigration can be seen as an individual’s private default option on government debt.* (...)”.

The emigration-driven aging of the CEE populations are at the center of heated debates in those countries and, according to the recent IMF analysis by Batog et al. (2019), will have profound economic consequences in that region. More specifically, Batog et al. (2019) report that the estimated average impact of labor force aging on the annual growth rate of real GDP per capita growth between 2020 and 2050 amounts to almost -0.5 percentage points making the CEE countries at risk of “growing old before becoming rich”. Moreover, Batog et al. (2019) argue that increases in taxes or rising public debt and higher borrowing costs associated with fiscal pressures that are driven by the aging process may crowd out private investment and give rise to a feedback from fiscal pressures back to economic growth.

Intuitively, all the abovementioned mechanisms (through which labor mobility affects economic performance, living standards and fiscal sustainability) work in the opposite direction in countries with positive net migration rates. This, in turn, suggests that a reduction of labor mobility barriers in regions where countries feature substantial heterogeneity and where national governments run independent fiscal policies creates “winners and losers” in the long-run and by leading to a polarization of countries across GDP per capita and fiscal conditions measured with debt to GDP levels.

Motivated by these considerations, this paper analyzes the impact of labor mobility on economic performance, living standards and fiscal sustainability in a region composed of countries featuring high level of persistence of income heterogeneity. To this end, we construct a multi-country model populated by two overlapping generations of agents (young workers and the elderly who do not work) where independent, benevolent governments con-

duct optimal, time-consistent fiscal policies and we compare two equilibria: the one in which cross-country migrations are allowed and the other in which borders are closed. Our model is a version of the framework proposed by Song et al. (2012) modified along several dimensions and calibrated to replicate the patterns characterizing the intra-EU migrations, country-level productivity dynamics and fiscal conditions in the EU. First, to give rise to the feedback loop between fiscal sustainability and migrations as discussed in Brunnermeier et al. (2016) and to capture the relationship between debt levels and interest paid on sovereign debt, we add partial default (similar to Arellano et al. (2019)). This element also allows to generate a realistic dispersion of prices of sovereign debt contracts, which depend on the country-level economic conditions. Second, to generate the cross-country differences in productivity levels and welfare, we introduce country-level productivity shocks that replicates the evolution of that magnitude in the EU countries. The most important extension of the model by Song et al. (2012) involves embedding a microfounded migration decisions as in Alessandria et al. (2019) which, after aggregation through a matching technology, generate the flows of workers across countries. From the technical point of view, unlike the matching functions applied to model migration processes in Ahlfeldt et al. (2015) and Tombe and Zhu (2019) across a finite set of regions, our function governs flows of workers across a continuum of areas.

Contrary to the conventional wisdom discussed above, we find that higher labor mobility does not lead to a polarization of fiscal conditions across countries. Instead, it leads to a uniform and substantial reduction in public debt across countries (NUMBER). This difference follows because intuitions described above ignore an important element which is an endogenous reaction of fiscal authorities to the exposure to higher labor mobility. In particular, benevolent governments recognize the benefits from additional labor inflows and therefore accomodate their policies to attract foreign workers by increasing the level of lifetime utility of younger generation. To raise that value, governments decrease its two time-separable components: the current utility of young agents and their felicity when they turn old. First component is increased by reducing the provision of public services in the current period (which are consumed mostly by the cohort of agents who are old in the current period). Second component is increased by creating more fiscal space for the future government so that it has more resources to provide public services for the workers that are currently young and turn old in the next period. The raise in the fiscal space is achieved by reduction in the amount of public debt issued today which becomes a liability of future government. This, in turn, leads to a reduction of debt-to-GDP levels across countries, lowers the real rates on financial markets and, as a consequence, crowds-in private capital in all countries. This process - “a rising tide that lifts all boats” - mitigates the polarization of GDP per capita, which is driven by higher dispersion of old-age dependency ratio which is generated by a rise

in labor mobility.

References

- Ahlfeldt, G. M., Redding, S. J., Sturm, D. M., and Wolf, N. (2015). The Economics of Density: Evidence From the Berlin Wall. *Econometrica*, 83:2127–2189.
- Alessandria, G., Bai, Y., and Deng, M. (2019). Migration and Sovereign Default Risk. Working paper.
- Arellano, C., Mateos-Planas, X., and Rios-Rull, J.-V. (2019). Partial Default. NBER Working Papers 26076, National Bureau of Economic Research, Inc.
- Batog, C., Crivelli, E., Ilyina, A., Jakab, Z., Lee, J., Musayev, A., Petrova, I., Scott, A., Shabunina, A., Tudyka, A., Xu, C., and Zhang, R. (2019). Demographic Headwinds in Central and Eastern Europe. The Departmental Paper Series 19/12, International Monetary Fund.
- Brunnermeier, M. K., James, H., and Landau, J.-P. (2016). *The Euro and the Battle of Ideas*. Number 10828 in Economics Books. Princeton University Press.
- Mundell, R. (1961). A Theory of Optimum Currency Areas. *American Economic Review*, 51(4):657–665.
- Song, Z., Storesletten, K., and Zilibotti, F. (2012). Rotten Parents and Disciplined Children: A Politicoeconomic Theory of Public Expenditure and Debt. *Econometrica*, 80(6):2785–2803.
- Tombe, T. and Zhu, X. (2019). Trade, Migration, and Productivity: A Quantitative Analysis of China. *American Economic Review*, 109(5):1843–1872.