

# Dynamic Macroeconomic Implications of Immigration\*



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*Against the background of increasing immigration flows in recent decades, we make use of rich microdata to quantify the macroeconomic effects of immigration shocks. The results show that a refugee immigration shock, similar in size to the increase in refugee immigration in Sweden around the Syrian refugee crisis of 2015, leads to a reduction in GDP per capita of 1.7 percent and an increase in aggregate unemployment of 2.2 percentage points initially. The effect on GDP per capita is persistent: it takes twenty years for 80% of the effect to dissipate. Even though immigration can have positive fiscal effects, this benefit is found to be dominated by the facts that immigrants have substantially lower productivity than natives and that their integration into the labor market is slow. Policies that reduce structural unemployment and speed up the integration of immigrants into the labor market can substantially decrease these costs.*

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## Immigration shocks are large

International immigration flows are large and have been growing in recent decades. Two prominent relatively recent examples are the Syrian refugee crisis that reached its peak in 2015, and the current inflow of Ukrainian refugees due to Russia's attack on Ukraine. In addition to being large, immigration flows are also highly volatile. In fact, compared to most macroeconomic time series the volatility of immigration is staggering: changes in annual growth rates of  $\pm 50$  percentage points are not unusual for large European countries like Spain or Germany (Eurostat, 2020). This high volatility in combination with the fact that integration into the labor market is relatively slow, implies that immigration flows can have long-lasting effects on our economies. From a macroeconomic perspective, immigration can be thought of as one of many aggregate shocks and it is important to understand and quantify its aggregate consequences, just as the macroeconomic literature does for technology or monetary policy shocks.<sup>1</sup>

Even though a literature that analyses the implications of immigration in different dimensions exists, this literature mainly focuses on micro-level effects of immigration, such as the effect on native's wages. The *aggregate* effects of immigration, however, have been studied less, and, in particular, the *dynamic* effects of immigration shocks on macroeconomic aggregates is little studied in the literature.

In recent work (Olovsson, Walentin and Westermarck, 2022), we set out to fill this gap by building a model where we employ rich microdata to guide the quantification of various type of immigration shocks. Specifically, we focus on Sweden and feed the model with detailed Swedish data on the entire population to match labor force participation rates and unemployment for natives, general immigrants and refugees. As explained below, these dynamic features are crucial when it comes to quantifying the fiscal and macroeconomic effects of immigration. We then use the structural model to analyze the effects on macroeconomic aggregates following large changes in immigration, such as the Syrian or Ukrainian refugee crisis.

## The fiscal effects of immigration

Before we go into the results, it is useful to first summarize the main fiscal effects that immigration can have on an economy. One such effect is the so called "demographic dividend" that can arise from age differences between natives and migrants. Specifically, as long as migrants arrive early in their working age and are employable, immigration will have positive fiscal effects. For instance, immigration has the potential to improve the old-age dependency ratio. Indeed, this is an important contributor to the positive welfare effects from immigration that are found in Busch et al. (2020).

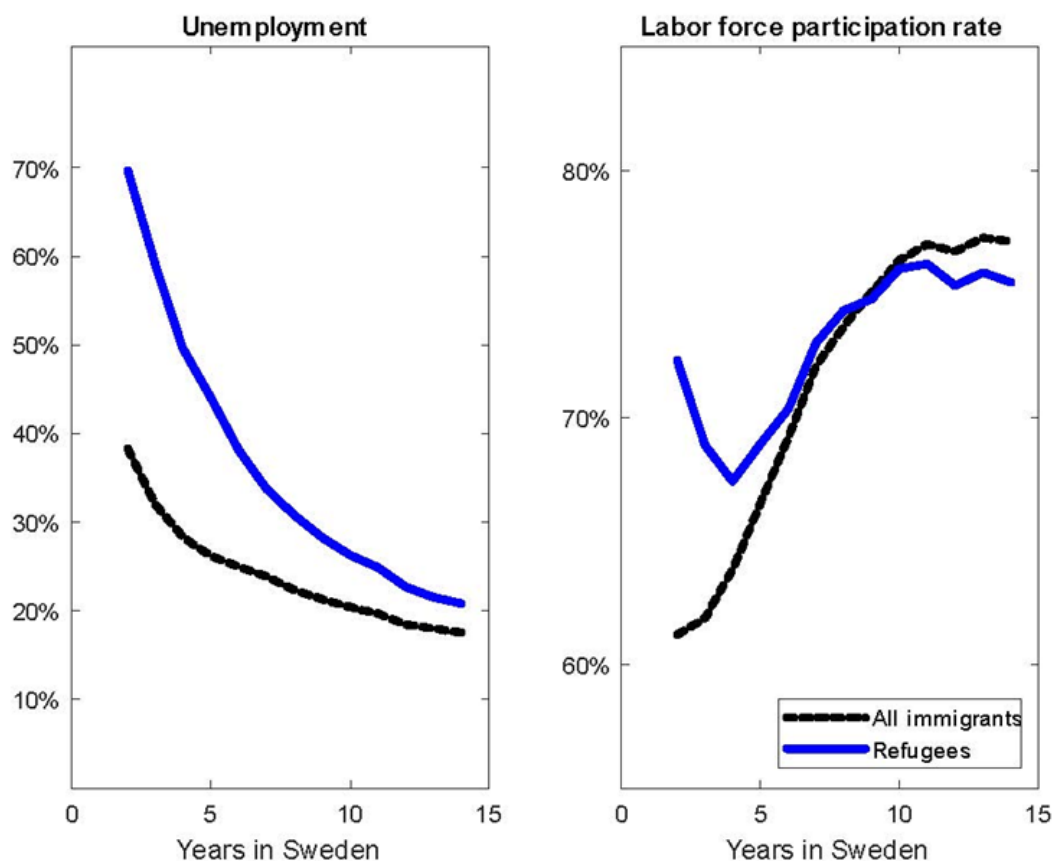
An offsetting effect, however, can come from the fact that the integration of immigrants into the labor market only is gradual and slow-moving. It is a well-documented fact that employment rates for immigrants in both the U.S. and Western Europe start below the employment rates of natives and are increasing in the number of years since immigration.<sup>2</sup> This pattern is even more pronounced for refugees. As a result, it may take a long time before become their employment rates and productivity reach the same levels as natives.

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<sup>1</sup> See also Furlanetto and Robstad (2019) that finds that immigration is an important driver of aggregate fluctuations.

<sup>2</sup> See Brell et al. (2020) and Busch et al. (2020).

**Figure 1: Unemployment rate and labor force participation rate as a function of number of years since immigration**



The slow-moving integration of refugees in Sweden is illustrated by the solid blue lines in Figure 1. The black dashed lines document the corresponding rates for all immigrants. The left graph shows that the unemployment rate is almost 70% in the first year after arrival, and that it then falls quite fast. The unemployment rate for immigrants that have been almost 15 years in the country, is still more than twice as high as for natives (6.75%). Similarly, as shown in the right graph, the labor force participation rate starts low and never really approaches that for natives (87%).<sup>3</sup>

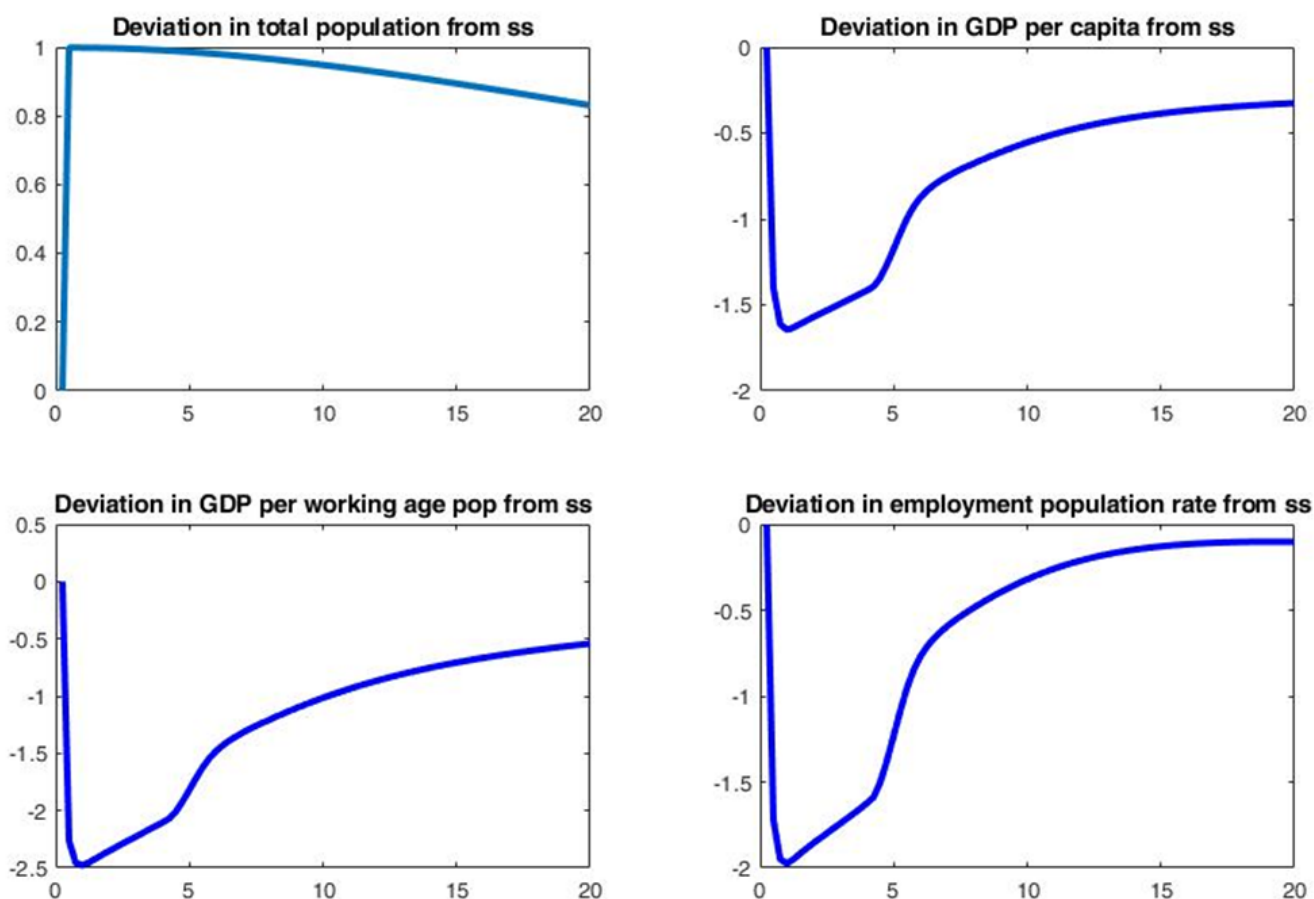
In order to quantify the effects of immigration it is thus crucial to employ micro data to match these moments (as well as other characteristics of the labor market) to evaluate whether the positive or the negative effect dominates. A specific notable advantage of using Sweden as our "laboratory" is exactly that it enables us to use unique microdata estimates of differences in labor productivity by country of birth obtained using rich matched employee-employer datasets documented in Ek (2018). These productivity differences by country of birth naturally leads to observed differences between natives and various groups of immigrants in e.g., wages and unemployment rates. We make sure that, among other things, the model matches the dynamic paths for unemployment and labor force participation documented in Figure 1.

<sup>3</sup>The initial fall in LFP for refugees is due to their substantial participation in labor market programs (and thereby classified as unemployed and in the labor force) right after residence is established.

## Macroeconomic effects of immigration

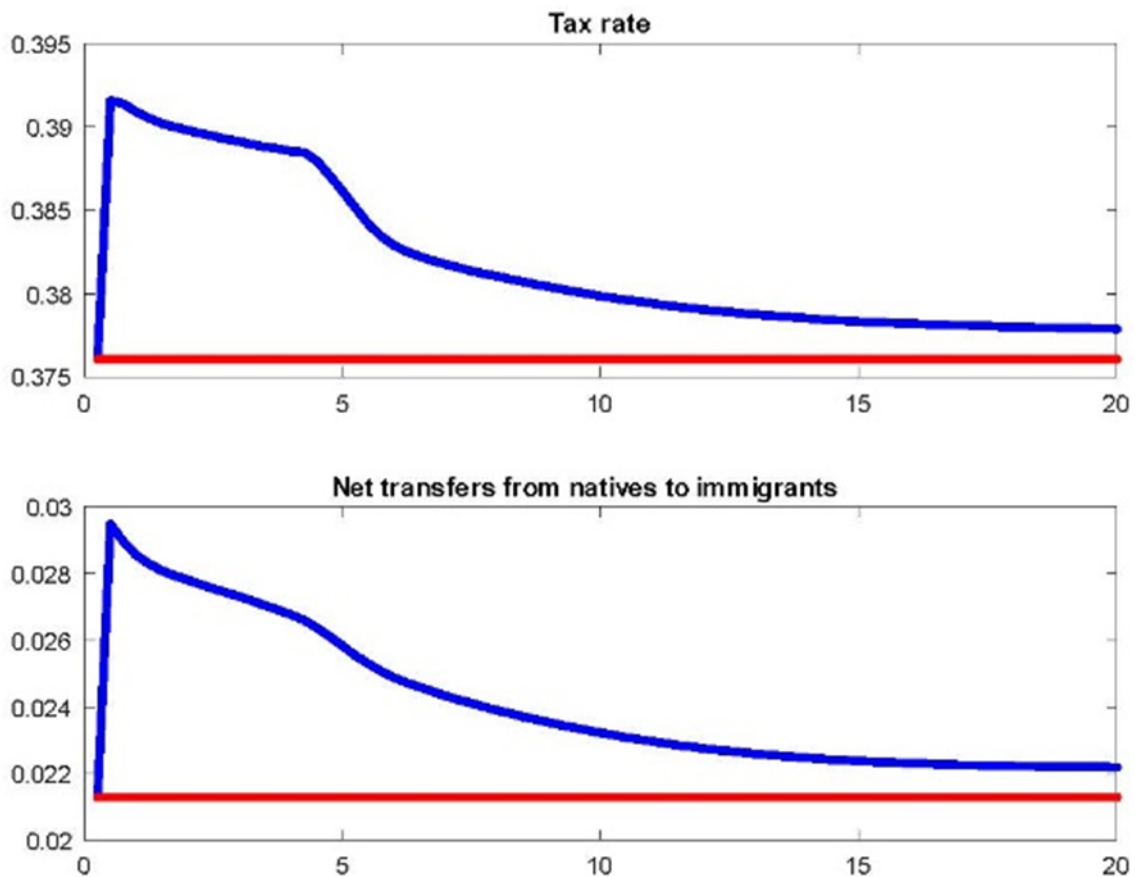
Our first exercise is thus to analyze the effects of a refugee immigration shock corresponding to one percent of the total population, similar in size to the increase in refugee immigration in Sweden around the refugee crisis of 2015. This shock leads to a reduction in GDP per capita of 1.7 percent and an increase in aggregate unemployment of 2.2 percentage points initially, see Figure 2 for the dynamic effect. The effect on GDP per capita is persistent--half of the initial effect remains after seven years, and it takes twenty years for 80% of the effect to dissipate. These are thus large and persistent effects.

**Figure 2: Percentage changes in total population, GDP, and the employment-to-population ratio from an immigration shock that corresponds to one percent of the total population. The scale on the x-axis is annual**



In addition to the high unemployment and low labor force participation rates of the newly arrived immigrants, the income tax must also be increased to finance the larger share of people that are non-employed (either because they are unemployed or not in the labor force). If the government runs a balanced budget, the labor income tax rate must be increased by 1.6 percentage points on impact, and then remain elevated for an extended period of time, see Figure 3. The higher tax further discourages job creation and results in an increase in unemployment, also for low-skill natives. Unemployment of high-skilled natives is, however, roughly unaffected by the immigration shock. The *net transfers* from natives to immigrants increase by 0.8 percent of GDP and then decline gradually as immigrants become integrated, see Figure 3.

Figure 3: Effects on tax rates and fiscal transfers



We find that the impact of the refugee shock on the *employment-to-population* ratio is the key driver of the other macroeconomic variables. Relating back to the above discussion about the demographic dividends versus the slow-moving integration of immigrants into the labor market, this ratio is pushed upwards due to the demographic dividend that contributes to a lower old-age dependency ratio - because a larger fraction of refugee immigrants than natives is of working age. The dominating force, however, comes from the fact that refugee immigrants have substantially lower average productivity than natives in combination with the slow-moving integration of immigrants into the labor market. Hence, in contrast to Busch et al. (2020), the result is a reduction in GDP per capita, an increase in unemployment and a higher labor income tax.

Finally, the effects on aggregate wages and productivity are very limited. In line with the empirical literature, the effects on wages of natives are even smaller, basically negligible, except for the first few quarters.

### Composition of immigration matters - effects of economic migration

As an additional exercise, we contrast the benchmark scenario with one of economic immigration from advanced countries. Specifically, we then show that if immigrants are of working age when they arrive to the new country (as in the experiment above), but are otherwise identical to natives in terms of productivity and labor force participation, then this type of immigration implies a substantial demographic dividend.<sup>4</sup> Hence, economic immigration results in a large increase in the employment-population ratio and GDP per capita in the medium run. Moreover, tax rates and fiscal transfers to immigrants are then both lower.

<sup>4</sup>The assumption that economic immigrants' productivity is equal to natives' is motivated by the immigration into Sweden during the post-war period up to the 1970's. Ekberg (2009) describes data for wages and the employment rate in 1978 for immigrants, controlling for age and sex, and finds that the average wage for immigrants was 98% of the native wage and the employment rate was the same as for natives. This indicates that immigrants were fairly similar to natives in that period, when economic migration dominated.

## Policies that can reduce the costs

There are two potential policies that can be implemented to mitigate the negative effects that we found on GDP per capita and unemployment from refugee immigration. The first one is to allow tax smoothing instead of running a balanced budget. Specifically, the balanced budget implies that the tax rate increases substantially in response to an immigration shock. This reduces incentives for job creation and leads to large (negative) effects on GDP and unemployment. If instead, the government finances the extra costs incurred by immigration over several decades, the initial effects on GDP and aggregate unemployment are substantially reduced. In particular, the increase in unemployment for low-skilled natives is less than one fifth as large as with a balanced budget.

The second way that the government can reduce the costs involves policies that aims at reducing structural unemployment. For instance, a reduction in unemployment benefits is found to substantially increase the speed of adjustment to the steady state. Policies aimed at improving the integration of immigrants have similar effects.

## Conclusions

Against the background of increasing immigration flows in recent decades, we quantify the dynamic effects of immigration shocks on macroeconomic aggregates. On the one hand, immigration can generate a demographic dividend to the extent that migrants arrive early in their working age and are employable. On the other hand, the integration of immigrants into the labor market is generally slow, which may lead to higher unemployment and taxes. We set up a model and employ rich microdata to incorporate and match these effects as well as other important aspects of the Swedish economy. We then use the model to quantify the macroeconomic effects of immigration shocks. We find that a refugee immigration shock corresponding to one percent of the total population (similar in size to the increase in refugee immigration in Sweden around the Syrian refugee crisis of 2015) leads to a reduction in GDP per capita of 1.7 percent and an increase in aggregate unemployment of 2.2 percentage points initially. The effect on GDP per capita is persistent---half of the initial effect remains after seven years, and it takes twenty years for 80% of the effect to dissipate. Policies that reduce structural unemployment and speed up the integration of immigrants into the labor market can substantially decrease these costs. ■

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