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# The Macroeconomic Effects of Large Immigration Waves

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# The Macroeconomic Effects of Large Immigration Waves[1]

**Prepared by Philipp Engler, Margaux MacDonald[2], Roberto Piazza, Galen Sher**

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**ABSTRACT:** We propose a novel approach to measure the dynamic macroeconomic effects of immigration on the destination country, combining the analysis of episodes of large immigration waves with instrumental variables techniques. We distinguish the impact of immigration shocks in OECD countries from that of refugee immigration in emerging and developing economies. In OECD, large immigration waves raise domestic output and productivity in both the short and the medium term, pointing to significant dynamic gains for the host economy. We find no evidence of negative effects on aggregate employment of the native-born population. In contrast, our analysis of large refugee flows into emerging and developing countries does not find clear evidence of macroeconomic effects on the host country, a conclusion in line with a growing body of evidence that refugee immigrants are at disadvantage compared to other type of immigrants.



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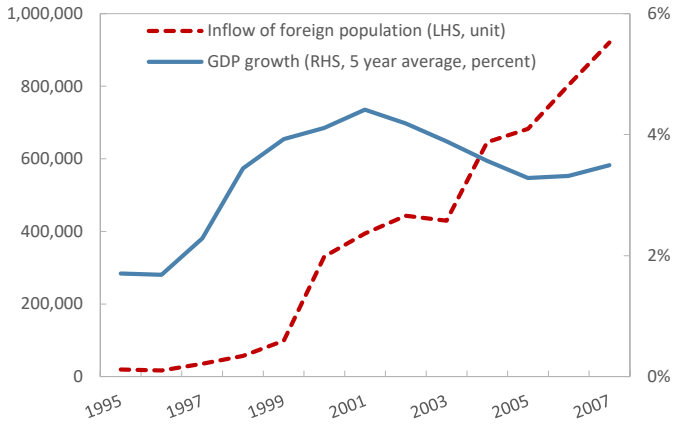
# 1. Introduction

Spain experienced a wave of immigration starting in the early 2000s, which raised the share of foreign-born population from about 2 percent in 2000 to 12 percent in 2011. It happened at the time of an economic (especially real estate) boom and record low unemployment rates (Figure 1). Did the immigration cause the economic growth, or was immigration simply driven by the improved economic prospects at the time?

Disentangling the macroeconomic effects of migration from the drivers of migration can be difficult. Since migration is often in search of better economic opportunities (Grogger and Hanson, 2011), prospects for economic growth in a given destination country may draw migrants in, rather than being a consequence of immigration.

**Figure 1. Large migration waves and economic activity: Spain**




Source: OECD and IMF

Note: Data is for Spain. Immigration includes persons obtaining lawful permanent resident status, refugee arrivals, and persons granted asylum. It excludes naturalizations and illegal immigration.

We propose a novel approach to measure the dynamic economic effects of immigration on the destination country, combining the analysis of episodes of large immigration waves with instrumental variables techniques. By focusing on large immigration waves, we can find those immigration episodes that are more likely to have been driven by external forces, like negative events s in source countries, rather than by improved economic prospects in the destination countries. To ensure that this procedure indeed isolates episodes led by emigration from source countries, we construct an instrumental variable based on total emigration from other countries and the share of immigrants already hosted in the destination country. Our motivation for this instrument is the well-known pattern that migrants from a given source country tend to choose destination countries that already host a large number of immigrants from that source country (Beine, Docquier and Özden, 2011). To obtain a more complete picture of the effects of different types of migration, we contrast the macroeconomic effects of immigration in advanced economies, which is mainly motivated by the

search for better economic perspective, with the effects of refugee migration, which to a large extent takes place between emerging and developing economies.[3]

We also provide estimates of the effects of migration over different time horizons. This is important because the immediate macroeconomic impact of immigration can differ from the medium-term impact. In the short term, prices are sticky, production inputs like the capital stock cannot easily be increased in response to an influx of labor, and the allocation of labor across sectors is almost fixed. Over the medium term, these features can adjust to the arrival of immigrants, thus determining the overall dynamic impact of immigration. This focus on the full dynamic macroeconomic effects of immigration contrasts with much of the empirical literature that focuses either on microeconomic aspects or on long-run aggregate effects.[4] One notable exception is Ortega and Peri (2009), which we discuss below.

Our methodology follows three steps. In the first, for each destination country we identify immigration episodes that are large both relative to the country's historical experience and relative to a typical immigration episode at the global level. We then move to tackle the reverse-causality problem, where good economic conditions may cause large immigration inflows (Peri and Sparber 2009, and Card 2001). This issue is addressed in the second step, which is based on constructing appropriate instrumental variables (IV) to capture the component of immigration flows that is exogenous to domestic cyclical conditions. In the study of the impact of migration to advanced economies a typical shift-share IV following Card (2009) constructed from past stocks of immigrants from different origin countries. In the study of the impact refugee flows into emerging and developing countries we define the IV from a combination of the historical bilateral migration flows and proximity variables from the migration gravity literature. The third and final step relies on a two-stage local projections regression (Jordà 2005) to trace out the dynamic impact of immigration shocks on macroeconomic variables (such as output, employment, productivity) of the host country.

We find that, in advanced countries, large immigration shocks raise output and productivity in both the short and the medium term, pointing to significant dynamic gains for the host economy as a whole. For instance, we find that a 1 percentage point increase in the ratio of the immigrant flow relative to total employment raises output by almost 1 percent by the fifth year. We find no evidence of negative effects on aggregate employment of the native-born population.[5] In contrast, our analysis of refugee flows into emerging and developing countries does not find evidence of economic effects

[3] Throughout the paper we use the term "migrant" to refer to non-refugee migrants, and "refugee" to those individuals who have been forced to leave their country to escape war, persecution, or natural disaster, as defined by the United Nations.

[4] See, for instance, Peri (2016) and Clemens (2011).

[5] We define "native" populations as those individuals who were born in the country they currently reside.

on the host country. These results are consistent with the view that migration to advanced economies has largely an "economic" nature and that migrant labor features important complementarities with that of the native-born population (Alesina, Harnoss and Rapoport, 2016). Refugee migrants are instead quite different from "economic" migrants. Refugees have little time or opportunity to best select their destination country, since their choice to migrate is driven by factors such as the risk of physical harm and vulnerability to persecution (Brell, Dustmann, and Preston 2020). That said, the literature has found that, in specific cases where there is strong social support for refugees (including policies to recognize refugees' qualifications) or where refugees' skills are well matched to the recipient country's labor market, there may be economic gains from refugee immigration (Aiyar and others, 2016; Alvarez and others, 2022).

Our paper is related to several strands of literature. The first is about the positive long-run impact of immigration on productivity in advanced countries (Peri 2011b; Ortega and Peri 2014; Alesina, Harnoss, and Rapoport 2015; Jaumotte, Koloskova, and Saxena 2016). As immigrants enter the labor market, the native-born move to new occupations, which, in many cases, require higher linguistic and communication skills or the performance of more complex tasks. As the native-born upgrade their skills, economy-wide productivity gains materialize (Peri and Sparber 2009; Hunt and Gauthier-Loiselle 2010; Farré, González, and Ortega 2011; D'Amuri and Peri 2014; Ortega and Peri 2014; Alesina, Harnoss, and Rapoport 2015; Cattaneo, Fiorio, and Peri 2015; Peri, Shih, and Sparber 2015a and 2015b). Beyond labor composition effects, the speed of response of physical capital to an increase in the labor force is also a key element in generating dynamic gains from immigration, and one which we also study (Klein and Ventura 2009; Beerli and others 2020). An additional strand of literature directly related to our paper concerns the existence of significant differences in the labor market outcomes of "economic" migrants versus refugees (Evans and Fitzgerald 2017; Brell, Dustmann, and Preston 2020).

Of particular relevance in the context of our paper is the work of Ortega and Peri (2009), which shares with ours the goal of looking at the macroeconomic impacts of immigration and the "optimistic" conclusions on the effects of immigration in OECD countries. We enrich their analysis, along several dimensions. First, we look at a longer time period and a larger number of OECD countries, while focusing solely on large migration episodes. Second, we complement the analysis of the impact of migration to advanced economies with an estimate of the effects of refugee migration into emerging and developing economies. Third, we trace out the full dynamic response using a local projection methodology and an IV strategy that differs from theirs. Our paper also adds to the work by Aiyar and others (2016), which showed that a surge in refugees to Europe lead to a modest increase in GDP growth, by focusing on a global sample and, importantly, by including many countries that have much weaker social support systems for refugees than European ones .

Our findings on the possible existence of large aggregate gains from immigration in advanced countries invites the question of the distributional impacts, particularly related to potential losses that some individuals in the native-born population may experience. While we look at the impact of immigration on aggregate unemployment of the native-born population, an extensive

microeconomic literature exists on these topics which is beyond the scope of this paper—see for instance work from Card (1990) to Borjas (2016). Similarly, our work does not touch upon the issue of whether the increase in the heterogeneity of a society due to immigration may reduce support for the provision of public goods, such as education (Alesina, Baqir, and Easterly 1999; Speciale 2012), which could have effects of migration over time.

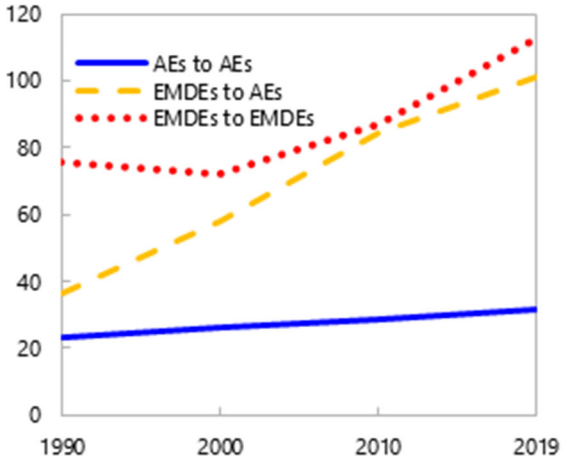
The paper proceeds as follows: section 2 briefly reviews trends in migration which establishes motivation for our analysis; section 3 explains our estimation procedure—including constructing and estimating our exogenous instrumental variables for migration and refugee shocks—and presents our results (including various robustness tests); section 4 concludes.

## 2. Recent Trends in Migration

Between 1990 and 2019, the migrant population increased by 120 million people, to reach 270 million. However, this increased matched population growth, so that the number of migrants has remained stable at 3 percent of the world population.

The drivers of migration flows are well established and include, among other things, demographic trends, relative income levels, and costs. Historical patterns of migration reflect in particular the high cost driver, in that migration occurs largely within broadly defined world regions (e.g. within Europe or Central Asia), where it is less constrained by the higher geographical and cultural barriers that characterize migration across continents. Nonetheless, large interregional migration corridors have become increasingly important, particularly towards rich countries (e.g. Latin America and the Caribbean to North America; South Asia to the Middle East; Middle East and North Africa to Europe) (Figure 2). Such migration patterns—primarily reflecting a search for better economic opportunities—are not new in history and have occurred even when transportation costs were much higher than today. Currently, immigrants make up about 12 percent of the population in advanced economies, up from 7 percent in 1990. Between 1990 and

**Figure 2. Migration corridors (millions)**

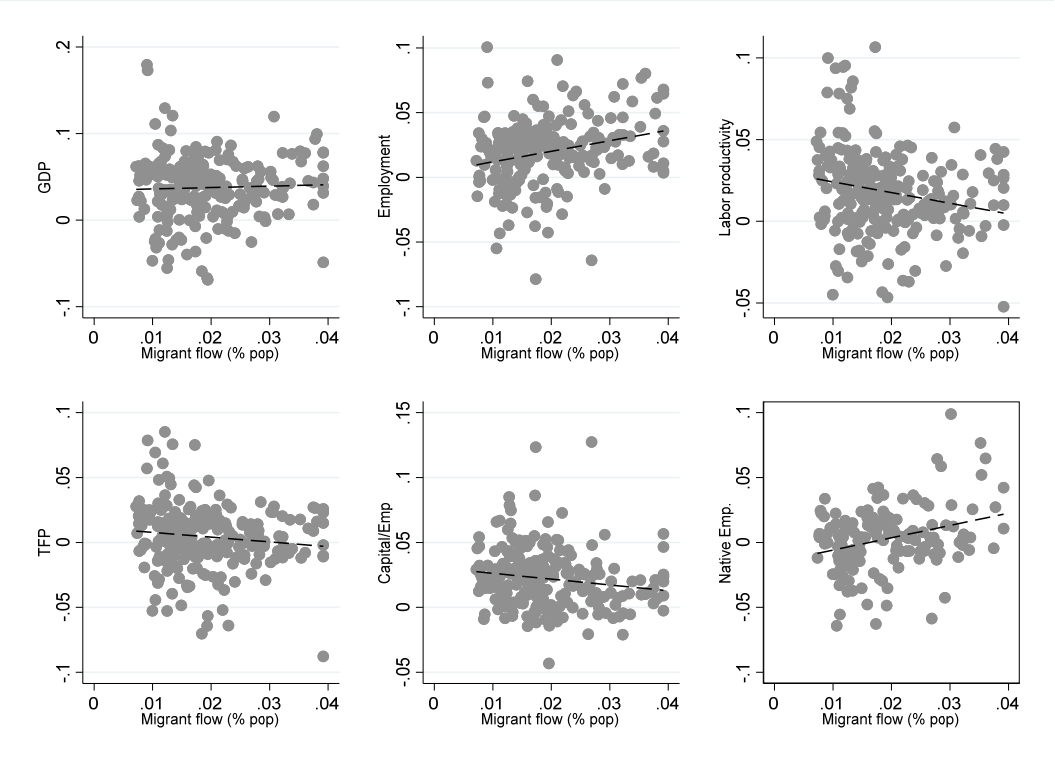



Sources: United Nation; and authors calculations.
Note: Migrants are defined as the foreign-born population. The figure uses the World Economic Outlook definition for advanced economies and emerging and developing economies. Arrows indicate migration from country of birth to country of residence. AEs=Advanced economies, EMDEs=Emerging and developing economies.

2019, the share of migrants from emerging and developing economies to advanced economies rose from 4 to 9 percent of the advanced economy population.

What is less well known—and the subject of our study—is the impact these migrants have on the macroeconomy of their host countries. Simply

**Figure 3. Migration flows and macroeconomic indicators**




Source: IMF World Economic Outlook; Penn World Tables; OECD; UN; World Bank; and author's calculations.

Note: the y-axis variables are the one-year ahead growth rates (log-difference) of the macroeconomic variables indicated. The x-axis is the identified migration shock episodes, where migration is defined as migration inflows as a share of employed population, and the series are winsorized at the top 1 percent. The sample is restricted to those observations used in the analysis in Section 3.

looking at static correlations of migration inflows against one-period ahead growth rates, as is shown in Figure 3, while potentially indicative of initial impacts of migrants, tells an incomplete story. As the figure shows, labor productivity and total factor productivity growth have a negative correlation with immigration flows. However, this does not necessarily mean that immigration slows down productivity growth, since the correlation might just as well be driven by the fact that immigrants prefer to move to countries with higher GDP per capita, which are also countries where productivity growth has slowed down. In contrast, there is a (slight) positive correlation between immigration and both GDP and employment growth. This does not necessarily imply that immigration increases GDP in the short run, but might instead signal that countries experiencing a short-run economic boom and labor shortages tend to ease immigration policies in order to fill domestic job vacancies. To address these and other problems of selection and reverse causality, our

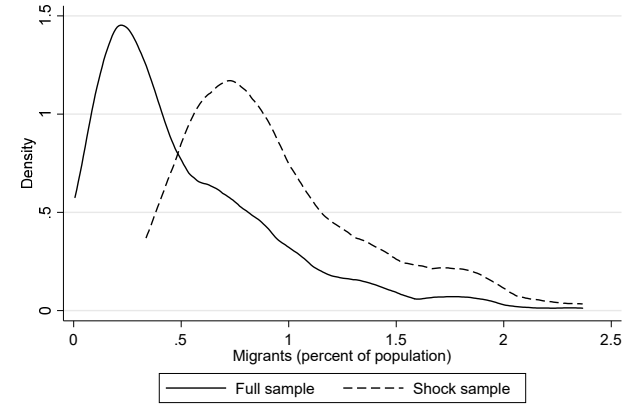
estimation strategy is based on a panel regression with an instrumented immigration shock and country-specific fixed effects, as described in the next section.

# 3. The Impact of Large Immigration and Refugee Waves

## 3.1. Instrumental variable strategy for immigrants into advanced economies

To analyze the economic impact of migrants on host countries we focus only on large immigration episodes. The reason for this narrow focus is that difficult conditions in source countries are more likely to trigger sudden migration surges than would strong economic growth in the destination country, helping to disentangle the effect of migrants on the economy of recipient countries. We examine primarily migration into advanced economies, because of the requirement for annual data.[6] However, in a second exercise (Section 4) we also examine the impact of large waves of refugees into emerging and developing economies. The estimation strategy follows three steps.

**Figure 4. Distribution of yearly immigration flow**




Source: OECD and author's calculations
Note: Figure plots kernel density estimates for the full and shock-restricted samples of migration per capital. The latter excludes the zero observations for non-shock observations, which are included in the later econometric analysis.

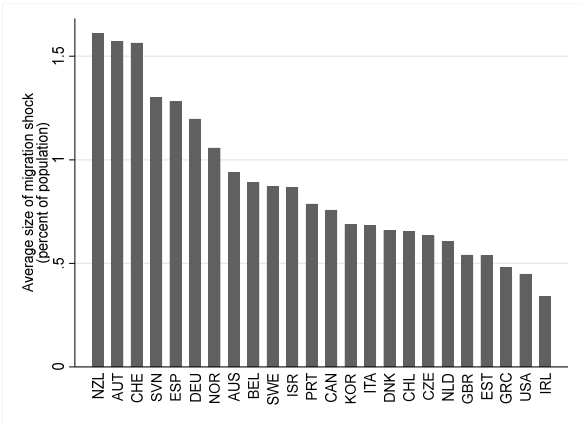
First, we identify "large" immigration episodes. A large immigration episode is classified as such if the annual inflow of migrants in the host country (as a share of population) is greater than the host country's median inflow of migrants during the period 1980-2018 and is greater than the median inflow (as a share of population) experienced by all OECD countries during the previous five-year period and the following five-year period. Inflow values are set to zero if they do not meet this "shock" criterion. Figure 4 plots the distribution of migrants per 100 population for the full sample (which includes both those episodes that meet the "shock" criterion and those that don't and that are set to zero in the regression) and for the shock sample, showing that the mean shock episode is just under 1 percent of the host country population per year, while for the full sample it is around 0.25 percent. In certain countries, the average size of the annual shock is well over 1 percent of the host country's population (Figure 5), and there were five episodes where the migration shock was over 2 percent of the host country's

[6] As explained in Section 3.4, the estimation is based on a sample of 34 OECD countries, the vast majority of which are advanced economies (29 countries based on the IMF World Economic Outlook income classification).

population in a single year (Solvenia 2008; Spain 2007; Germany and Austria 2015; New Zealand 2016).

With this shock definition in hand, the second step aims to further address the reverse-causality problem, where good economic conditions may cause large immigration inflows (Peri and Sparber 2009, and Card 2001). To address this issue, we use an instrumental variable (IV) approach. The IV is constructed such that it is independent from economic conditions in the recipient country, allowing us to isolate the impact of the migration inflow episode.

**Figure 5. Average size of yearly immigration shocks, by country**




Source: OECD and author's calculations

Our IV exploits an important property of migration patterns: migrants choose their destination partly based on the presence of networks of past migrants. Mechanically, the IV is constructed on the basis of a shift-share instrument following Card (2001) (among others):

$$\widetilde{im}_{it} = \sum_j \frac{M_{jit-5}}{M_{jt-5}} \Delta M_{jt} \quad (1)$$

Where $\left(\frac{M_{jit-5}}{M_{jt-5}}\right)$ is the share of the stock of migrants from origin *j* in destination *i* over the past 5 to 10 years, depending on data availability (migration stock data is available only at five-year intervals). This is multiplied by the total outflow of migrants, $\Delta M_{jt}$, from origin *j* in year *t*. The IV is winsorized at the top one percent (upper bound only) to account for extreme values created by our instrument due to data limitations or abnormal one-off flows. The resulting (winsorized) instrument has a relatively high correlation with the actual flows at 83 percent over the shock episodes.

## 3.2. Instrumental variable strategy for refugees

To identify the impact of refugees on host countries, we take a similar approach in defining an IV as we did in the previous section, with two important differences.

First, because refugee flows tend to be more volatile and with a fatter right tail than migration flows to advanced countries, we define refugee shocks as an inflow (as a share of population) that is within the country's top 10th percentile of inflows during the period 1980–2018 and is also greater than the top 10th percentile (relative to the recipient country's population) experienced by all countries in the world during the previous five-year period and the following five-year period. To avoid including

episodes characterized by sudden reversals, we also require the refugee inflow shock must be sustained for at least two consecutive years. Based on these criteria, the mean refugee shock episode equals 0.96 percent of the host country population per year (comparable to the mean of migration shock to advanced countries, but with a much larger standard deviation of 1.5 versus 0.43).Second, because refugees are often forced to flee suddenly and are not necessarily given a choice of their destination country, we defined our instrumental variable in such a way to capture the fact that refugee flows are more likely determined on the basis of proximity. Specifically, the IV is defined based on a combination of the historical flows between origin and host countries and proximity variables from the gravity in migration literature, as

$$\widetilde{ir}_{it} = \sum_j \frac{M_{jit-5}^{\alpha} D_{ji}^{\gamma} e^{\zeta \cdot contig_{ji}}}{\sum_i M_{jit-5}^{\alpha} D_{ji}^{\gamma} e^{\zeta \cdot contig_{ji}}} \Delta R_{jt} \quad (2)$$

Where $M_{jit}^{\alpha}$ is the stock of migrants from origin *j* in destination *i* at time *t*—as defined above; $D_{ji}^{\gamma}$ is the distance between origin *j* and destination *i* ; and $contig_{ji}$ is a dummy variable indicating whether the origin and destination countries share a border. The coefficients $\alpha = 0.4, \gamma = -0.8$, and $\zeta = 0.6$ are drawn from the gravity migration literature (see, for example, Beine, Bertoli, Fernandez-Huertas Moraga (2016)). This share proxy is then multiplied by total refugee outflows $\Delta R_{jt}$ from origin *j* in year *t*, as was done for the migration instrumental variable. As with our instrument for migrants, this version for refugees is also winsorized at the top one percent (upper bound only), and is relatively highly correlated with the actual flows, at about 72 percent over the shock episodes. Note that the winsorizing procedure used means that we do not fully capture the most extreme cases of refugee inflows, such as the recent episodes of refugee immigration into Colombia, Jordan, and Lebanon. All these episodes feature immigration flows greater than 4 percent of the recipient country's population. Therefore, our analysis captures the impact of large immigration waves, but our conclusions are not heavily influenced by the most extreme and rare ones, which would deserve a separate study.

## 3.3 Estimation

With our large migration episode IVs in hand, we proceed to our empirical model. We follow the local projections methodology (Jorda, 2005) to estimate the impact of a migration shock on macroeconomic outcomes, which allows us to trace out the dynamic response over time in the host country. Specifically, we estimate the following equation over an *h*-year horizon:

$$y_{i,t+h} - y_{i,t-1} = \alpha_i^h + \gamma_t^h + \beta_1^h \frac{\Delta IM_{it}}{E_{i,t-1}} + \varepsilon_{it}^h \quad (3)$$

Where $y_{i,t}$ are the macroeconomic outcome variables of interest: output, total employment, native-born employment, total labor force, native-born labor force, labor productivity, total factor productivity (TFP) (all in logs), the capital-output ratio, the aggregate unemployment rate, and the unemployment rate of the native-born population. The independent variable is the shock, measured as immigration inflows ($\Delta IM_{it}$) relative to the previous period's total employment level ($E_{i,t-1}$).

This is the relevant ratio to capture the impact of migrants, given that the majority of them are of working age and are potentially able to enter the labor force relatively rapidly. Country ($\alpha_i^h$) and time ($\gamma_t^h$) fixed effects are also included to capture time-invariant country-specific factors and global shocks that could affect macro-outcomes.

The model is estimated via two-stage least squares where the change in migration inflows is instrumented with our IV established in the previous section relative to employment ($\Delta\widetilde{im}_{it}/E_{i,t-1}$). The coefficient of interest is $\beta_1^h$, which captures the cumulative impact of the migration shock over *h* years.

Our estimation procedure for the impact of refugees on host countries is similar. We use equation (3) and replace the independent variable of interest with $\Delta IR_{i,t}/E_{i,t-1}$, where the numerator is the annual increase in the refugee stock in destination country $i$ (derived from a difference in stocks, due to data availability). The model is estimated via two-stage least squares where the refugee inflows are instrumented with our instrumental variable for refugee flows as a ratio of local to employment ($\Delta\widetilde{ir}_{it}/E_{i,t-1}$). The coefficient of interest is again $\beta_1^h$, which captures the cumulative impact of the refugee shock at horizon *h* years.

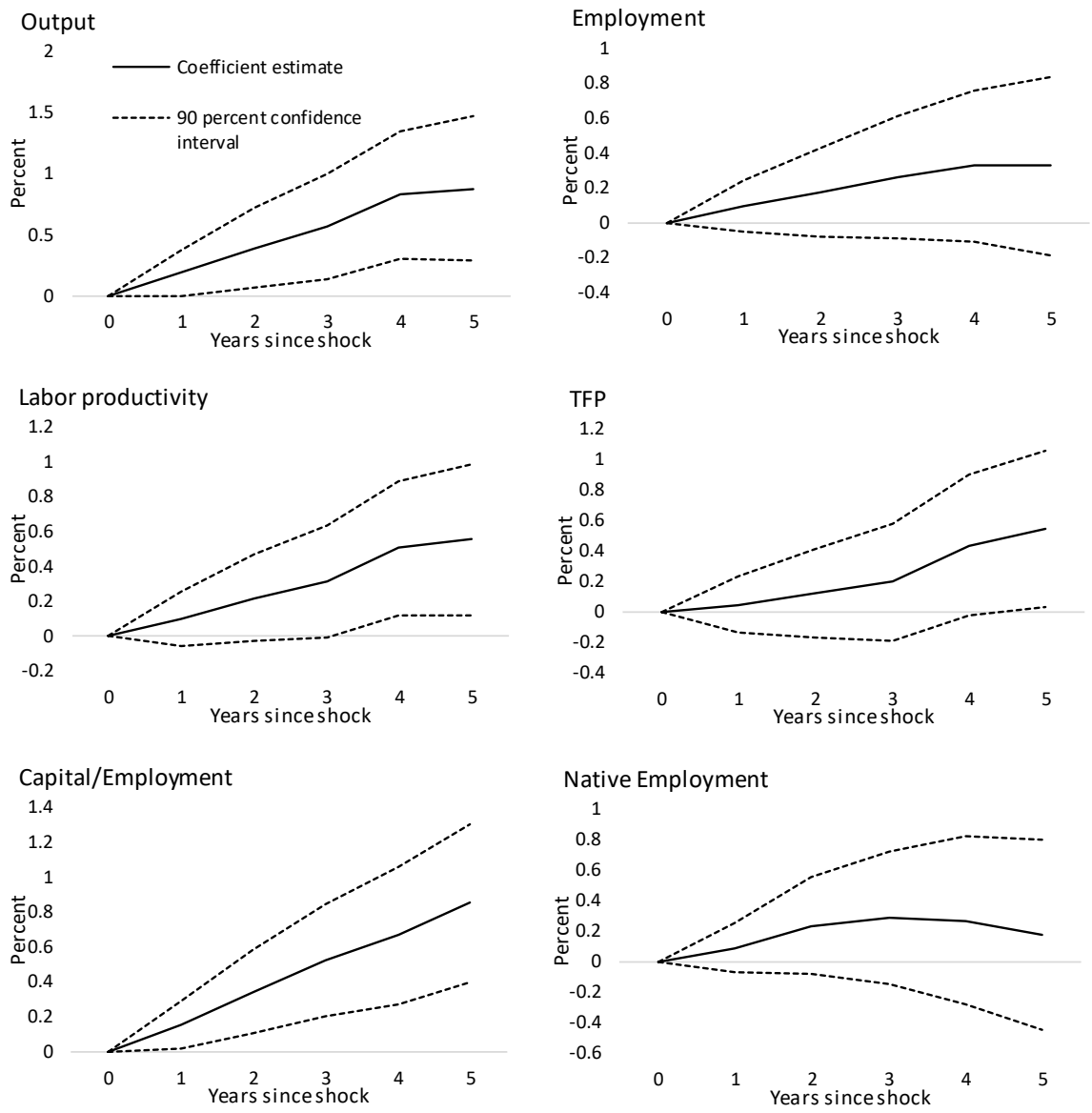
## 3.4 Data

Data for migration flows from the OECD, UN, and World Bank, are used for our independent variable and the shift-share IV for migration flows. We combine the 5-year migration stock data from the World Bank data for pre-1990 values of the shift-share instrument and UN data for the post-1990s shares, to get the widest data coverage possible. The annual OECD migration flow data is used for the measure of migration outflows from origin in our IV and our main independent variable—migration inflows to each destination country. Annual refugee stock data from the UNHCR, where we define refugees as the sum of individuals classified by the UNHCR as refugees, asylum seekers, and other persons of concern. Our sample covers 34 countries with 229 shock episodes over the period 1981-2016 for the analysis of migration to advanced countries and 137 countries with 179 shock episodes over the period 1981-2017 for the refugee analysis. Macroeconomic variables are taken from various sources: output, consumption, capital, and total productivity are from the Penn World Tables, aggregate employment variables are from the IMF's WEO database, and native-born employment variables from the OECD.

## 3.5 Results on the Impact of Large Immigration Waves

We begin by presenting in the results for the effect of immigration to advance economies. Figure 6 reports the responses, up to five years from the immigration shock, of our specification (3) using the shift-share IV (1). For each of the macroeconomic variables considered, the size of the effect indicates the variable's response to a 1 percentage point increase in the ratio of the immigrant flow relative to (the lag of) total employment.

**Figure 6: Macroeconomic impact of large immigration waves**




Source: Authors calculations.

Note: This figure depicts the effect of a 1 percent increase in the migration inflow to the employment ratio in the destination country on the macroeconomic variables indicated, estimated based on a sample of OECD countries from 1980–2018 using the local projections method of Jordà (2005). Year 0 is the year before the shock, and year 1 shows the effect of the shock on impact. The solid line represents the impulse response estimate and the dashed lines the 90 percent confidence interval. All dependent variables are in logs.

We find that output increases by almost 1 percent by the fifth year. About two-thirds of this increase is attributed to an increase in labor productivity, defined as total output divided by total employment, and the remaining one-third to employment growth (which is borderline insignificant, however). An increase in total factor productivity (TFP) matches the rise in labor productivity. As

the capital stock responds immediately to the higher TFP, its growth outstrips that of employment and, consequently, the capital-labor ratio rises.[7] When breaking down total employment growth into its components, the analysis does not detect any effect on the aggregate growth rate of employment of the native-born population.

As Section 1 indicates, most of the literature that investigates the productivity impact of immigrants' studies long-term effects. The question arises whether the aggregate effect of immigration could be less positive when looking at the short term or at large migration episodes such as those considered here. The concern is reasonable and motivated by the presence of various economic frictions, including slow adjustments in the labor market and in the capital stock. The results in Figure 6 suggest that aggregate gains from immigration materialize very quickly, even with potentially disruptive inflows. Overall, the immediate response of labor productivity points to the existence of significant dynamic gains from immigration, even in the short term.[8]

Some caveats should be considered when interpreting our estimated positive effects of immigration. Despite our efforts to address endogeneity by focusing on large immigration waves, using an exogenous instrument and including fixed effects, it may still be the case that our estimates still suffer from some endogeneity. This could be the case, for example, if there is a prolonged (over 10 years) upswing in the economic conditions in the destination countries that act as a pull factor and thereby make our shift-share IV not perfectly exogenous. Given these potential issues additional specification that control for persistent in the macro dependent variables and for other macroeconomic conditions, discussed in Section 4, are estimated as robustness checks. Nevertheless, one should still interpret the coefficient estimates as an upper bound.

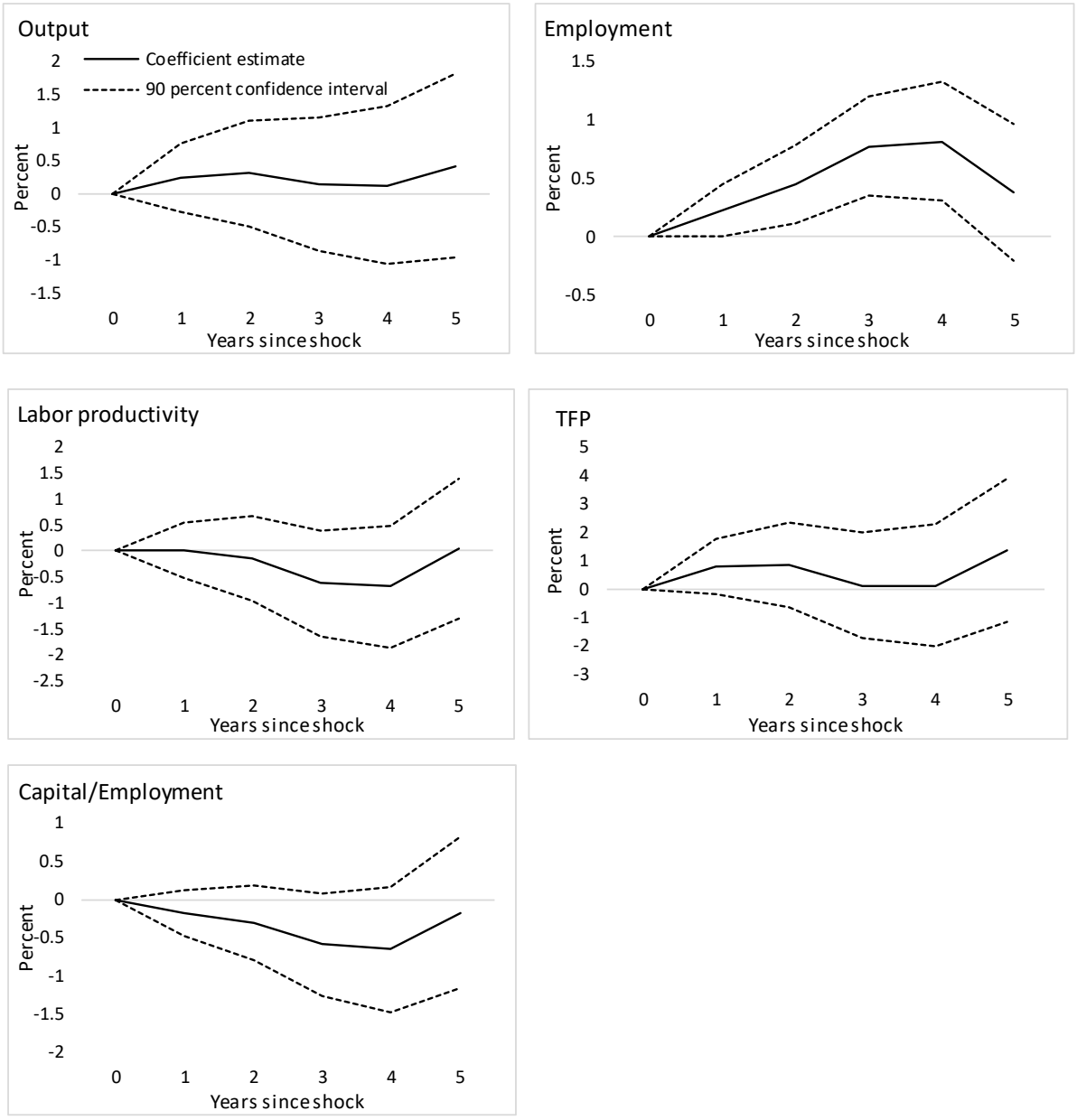
We conclude the section with a discussion of the results for the estimated impact of refugee shocks based on the IV in equation (2).[9] Figure 7 shows that we are not able to detect clear macroeconomic effects of immigration from refugee immigration in emerging and developing economies, at least within a 5-year horizon. Relative to Figure 6, the point estimates are either much smaller (as in the case of the output response) or their standard deviation is much larger (for almost all the variables). We do, however, see a statistically significant rise in employment—seemingly stemming from a rise in population following large inflow of refugees, with native-born workers not being crowded out—

[7] The estimated growth rate of labor productivity appears somewhat lower that what could be expected by considering the combined effect, reasonably weighted, of the growth rate of TPF and of the capital-labor ratio, However, it is worth bearing in mind that, in the context of a two-Stage least square regression, the estimated effect on a given variable dos not necessarily coincided with the sum of the estimated effects of its sub-components (see for instance Peri 2011).

[8] Beerli and others (2020) also present evidence of a fast response of investment to immigration in Switzerland. For the role of capital in capital following migrants, see Klein and Ventura (2009).

[9] We do not estimate the impact on employment of the native-born population due to data limitations in the emerging market and low-income country sample.

**Figure 7. Macroeconomic impact of large refugee waves**




Note: This figure depicts the effect of a 1 percent increase in the ratio of the refugee inflow relative to (the lag of) total employment in the destination country on the macroeconomic variables indicated, estimated based on a sample of OECD countries from 1980–2018 using the local projections method of Jordà (2005). Year 0 is the year before the shock, and year 1 shows the effect of the shock on impact. The solid line represents the impulse response estimate and the dashed lines the 90 percent confidence interval. All dependent variables are in logs.
Source: Authors calculations.

but it is not matched by a rise in capital or output, and therefore we do not see the positive impact on labor productivity that followed migration shocks. Although we cannot provide a definite answer on why the macro implications of refugee inflows are not statistically or economically significant at

this point at this point, our findings are consistent with two complementary observations, one statistical and one economic. The first is that our sample of large refugee flows (which includes flows with an average size, as a share of the destination country's population, that is comparable to migrant's flows to advance economies) has relatively fewer observations than those used in section 3.1. Consequently, the macroeconomic impacts of refugee shock may be swamped by statistical noise and thus be more difficult to tease out. Second, for a host of reasons discussed in the literature, integrating refugees into the labor market appears to be relatively inefficient (i.e. skills are likely not well matched with jobs) compared with migrants, with the consequence that their economic impact on productivity and output may be in fact small (Evans and Fitzgerald 2017; Brell, Dustmann, and Preston 2020).

## 4. Robustness

We check for the robustness of our results by controlling for additional variables. These include lags of the dependent variable for lagged real GDP growth and for lagged native-born employment growth. All results are broadly robust. Figure 8 reports results for the first robustness exercise (lagged dependent variable), and Figure 9 for a specification that includes all control variables (lagged dependent variable, lagged real GDP growth, lagged native-born employment growth). In both cases the estimated impulse response functions are broadly consistent with those in our baseline estimates of Figure 6, both in magnitude and precision, suggesting that our main results are not driven by an omitted variable bias.

## 5. Conclusion

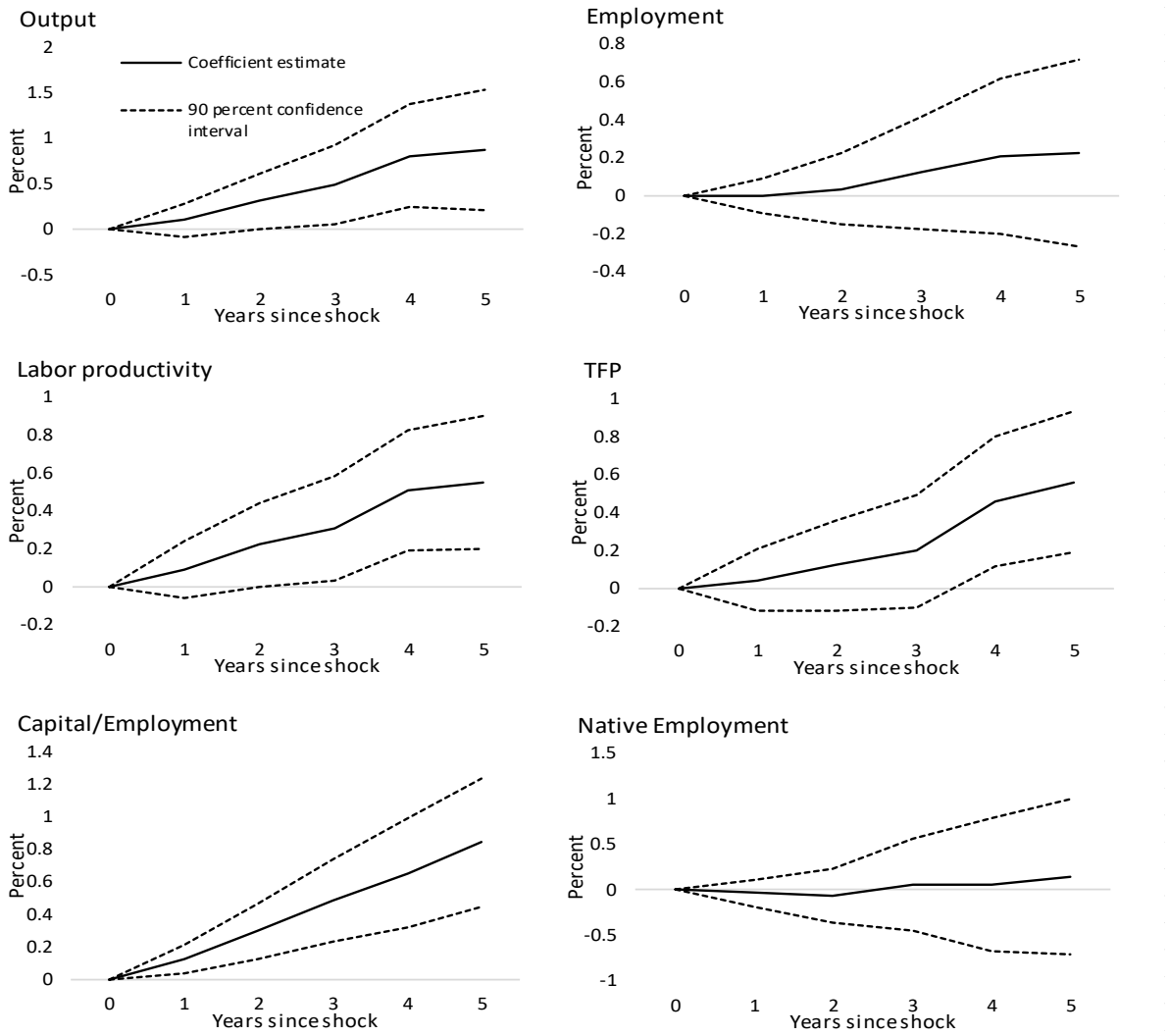
In this paper, we examined the question of the dynamic macroeconomic impact of immigration on recipient countries. This issue has found relatively little attention in the empirical literature, which has focused instead mostly on microeconomic aspect. One notable exception is Ortega and Peri (2009), which uses a panel of countries to present IV estimates of the impact of immigration on employment, investment and productivity. Based on our own gravity IV approach, we enrich their analysis along several dimensions by leveraging a rich sample of large immigration waves.

We find that our results for the impact of immigration in OECD countries are fully consistent with Ortega and Peri (2009) "optimistic" view that immigration does not have negative consequences on domestic employment, thanks to the rapid and vigorous positive response of investment. In fact, our findings are even more optimistic, since we find positive and sizable effects of large waves of immigration in OECD countries on domestic TFP. These effects materialize very quickly and are consistent with those found in long-run studies of the effects on immigration. Such "dynamic gains" from immigration, in the form of both rising TFP and investment, can be interpreted as evidence of complementarity between the skills of immigrants and the native-born population.

We also add to the literature by providing IV-estimates of the impact of large waves of refugee immigration into emerging and developing economies. In this case, we are unable to find statistically or economically significant effects (either positive or negative) on the dynamic evolution of domestic

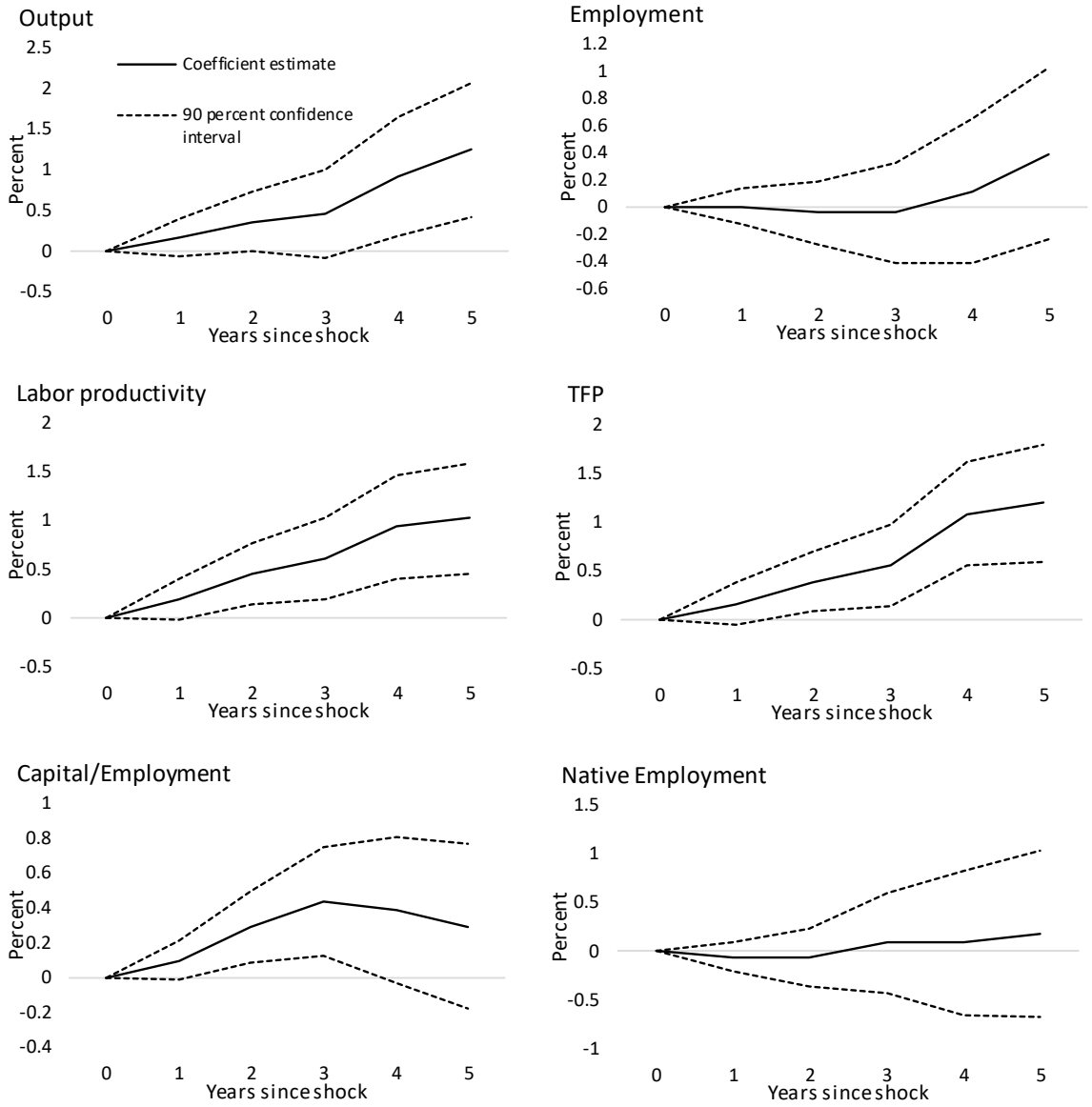
aggregates. Such findings appear to confirm the conclusions from growing body of evidence that refugee immigrants are at disadvantage compared to other type of immigrants. The conditions under which refugee migrate and the limited opportunities they have to participate in the labor market of their host countries substantially reduce their possibilities to contribute to their host economy.

**Figure 8. Macro impact of large immigration waves: Control for lagged dependent variable**




Note: This figure depicts the effect of a 1 percent increase in the migration inflow to the employment ratio in the destination country on the macroeconomic variables indicated. Impulse response functions are estimated using a version of equation (4) using the local projections method of Jordà (2005), with an additional control for lagged dependent variable, and on a sample of OECD countries from 1980–2018. Year 0 is the year before the shock, and year 1 shows the effect of the shock on impact. The solid line represents the impulse response estimate and the dashed lines the 90 percent confidence interval. All dependent variables are in logs.
Source: Authors calculations.

## Figure 9. Macro impact of large immigration waves: additional controls




Note: This figure depicts the effect of a 1 percent increase in the migration inflow to the employment ratio in the destination country on the macroeconomic variables indicated. Impulse response functions are estimated using a version of equation (4) using the local projections method of Jordà (2005), with additional controls for lagged dependent variable, real GDP, and native-born employment growth, and on a sample of OECD countries from 1980–2018. Year 0 is the year before the shock, and year 1 shows the effect of the shock on impact. The solid line represents the impulse response estimate and the dashed lines the 90 percent confidence interval. All dependent variables are in logs.
Source: Authors calculations.

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