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The fiscal impact of immigration in the EU

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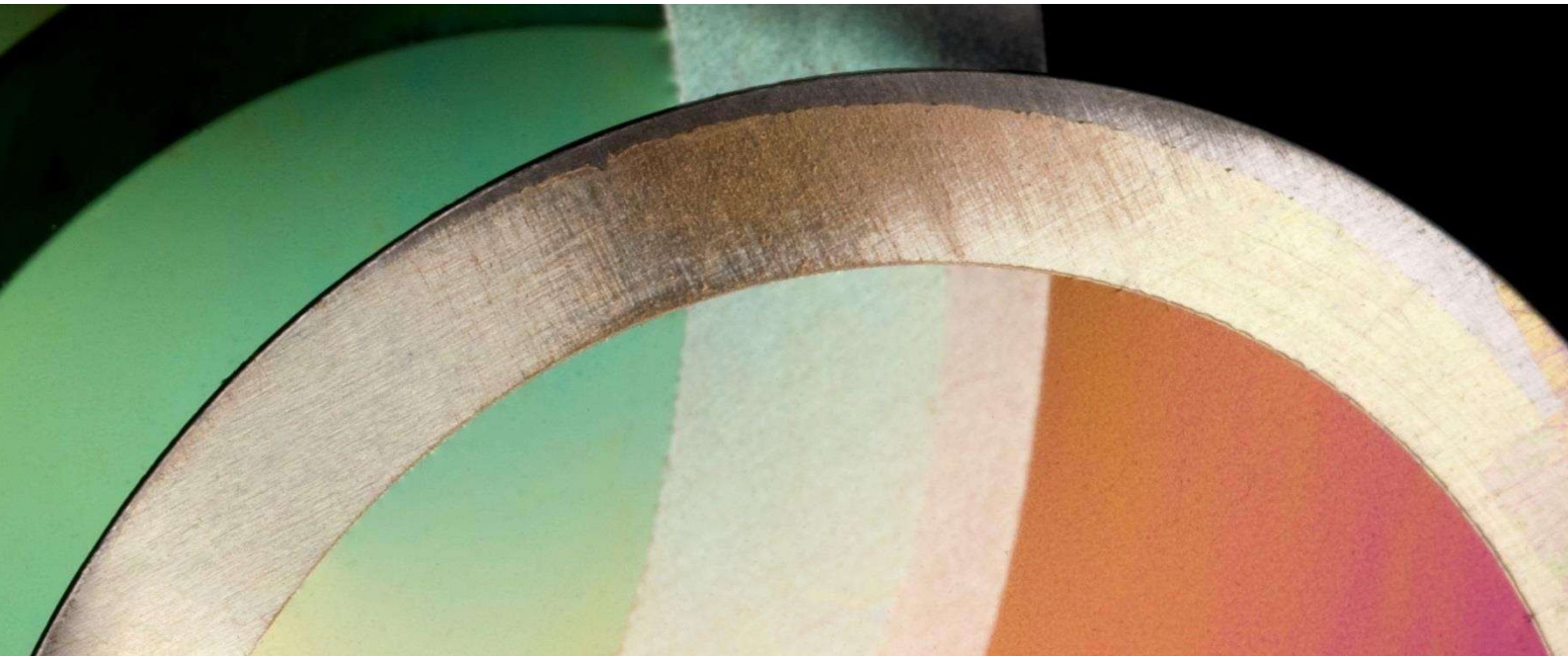

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Executive Summary

- In recent decades, many EU Member States have been experiencing low growth rates and rising economic inequality, as well as declining fertility and ageing population. These developments raise concerns about the sustainability of many European welfare systems that have been designed according to different demographic dynamics and structures. The current situation places the burden of providing the necessary budgetary resources to support European social protection standards on a shrinking active population.

- Potential solutions to these challenges, including reducing the social protection scheme, raising the retirement age in line with increasing life expectancy, and increasing labour market participation of all segments of the potentially active population, are strongly discussed among policymakers. In this complex policy portfolio, immigration can also be seen as an important element as it could partially compensate for the demographic deficit, broaden the tax base and thus contribute to economic growth. However, immigration also poses challenges, as the long-term net fiscal impact depends crucially on the integration of migrants into the labour market.

- Today, few comprehensive analyses at EU-wide on the net fiscal impact of immigration have answered how immigration affects the resources needed for social welfare systems. This is our goal in this paper.

- To assess the net fiscal impact of immigration we use EUROMOD, the tax-benefit microsimulation model for the European Union. EUROMOD is a unique tool for international comparative research on the effects of taxes and benefits, using individual and household data from the European Union Survey of Income and Living Conditions (EU-SILC).

- We expand EUROMOD with information on Value Added Taxes (VAT) by simulating VAT rules and using the Household Budget Survey (HBS) to account for different consumption patterns of migrants and natives. We also add information on in-kind benefits related to education, health care provision and social housing to the standard tax-benefit model.

- We combine static microsimulation modelling with a life-cycle approach to estimate the long-term implications of immigration. We calculate two concepts of net fiscal impact for natives, intra-EU and extra-EU migrants: the average net fiscal impact (ANFI) revealing the current impact of migrants on state budgets; and the life-cycle deficit (LCD) to obtain an estimate on the long-term implications.

- Simulation results suggest that, when considering the ANFI, both intra-EU and extra-EU migrants have a negative but higher net fiscal impact than the native population. This means that the average immigrant is currently less costly to the public budget than the average native. However, when we control for the age structure and obtain an estimate of the net fiscal impact over the life cycle (LCD), the estimates indicate that natives have a higher (less negative) net fiscal impact than intra-EU migrants, who in turn show a higher (less negative) net fiscal impact than Extra-EU migrants.

- Simulations also show substantial differences in both concepts of the net fiscal impact between EU Member States. This potentially reflects the differences in the characteristics and history of migration between Member States. Especially in traditional welfare states, such as Austria, Belgium, Denmark, Finland, the Netherlands and Sweden, the differences in the net fiscal impact between natives and extra-EU migrants throughout the lifecycle are

considerable, while the differences between natives and intra-EU migrants seem to be less pronounced. This divergent picture draws attention to the present challenge of labour market integration of extra-EU migrants particularly and suggests that better integration into the labour market could be the key to improving their fiscal contribution.

The fiscal impact of immigration in the EU

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Abstract

The increasing flows of immigrants in Europe over the last decade has generated a range of considerations in the policy agenda of many receiving countries. One of the main considerations for policy makers and public opinions alike is whether immigrants contribute their "fair" share to their host country tax and welfare system. This paper seeks to answer this question based on an empirical assessment of the net fiscal contributions of immigrants in the 27 EU Member States using EUROMOD, a EU-wide tax-benefit microsimulation model. In addition to the traditional view of the tax-benefit system, we add indirect taxation and in-kind benefits to the analysis of net contributions. Our findings highlight that migrants on average contributed about 250 euro per year more than natives to the welfare state in 2015. However, when we take an average age-specific life-cycle perspective, we find that natives generally show a higher net fiscal contribution than both, intra-EU and extra-EU migrants, while extra-EU migrants contribute on average less than intra-EU migrants.

Keywords: Migration, Microsimulation, Tax-benefit system, EUROMOD
JEL codes: F22, J15, H2, H5

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The views expressed are purely those of the authors and may not in any circumstances be regarded as stating an official position of the European Commission.

1. Introduction

The number of third-country nationals living in the EU has grown in recent years. According to the most recent figures by Eurostat for 2018, there are over 22 million third-country nationals residing in the 27 Member States (MSs) of the EU and the UK. This is up from 19 million in 2014 - the first available year for this series - corresponding to a 14% increase in five years. For many MSs, this phenomenon inevitably generates a range of social, political and economic considerations. One of the main considerations for policy makers and public opinions alike is whether migrants contribute their "fair" share to their host country tax and welfare system. Fears of welfare abuses are common among European citizens (Boeri, 2010) together with worries that the European welfare systems might act as a magnet for welfare-dependent migrants (De Giorgi and Pellizzari, 2009). These concerns are so deep that they outshine even worries about labour market effects of immigration in public opinion's assessment (Dustmann and Preston, 2007) and are hard to ignore for governments.

Apart from public attitudes on migration and questions of perceived fairness, understanding the fiscal impacts of immigration is especially salient for the EU MSs' decision-making processes, because it enables the design of an appropriate immigration strategy. The EU countries maintain a comparably extensive and generous welfare coverage[1] against the backdrop of deteriorating fiscal balances, in some MSs more than others, since the onset of the global financial crisis.

Migration can have both positive and negative consequences for the economies and the public purse of the receiving countries. On the one hand, a growing migrant population, mostly migrating in their most productive years, can help alleviate the financial burden that an ageing population imposes on the pension systems of many MSs. On the other hand, migrants may represent a burden because of the costs associated with their integration and inclusion, family structure and/or to the safety net for their labour career. Depending on whether positive or negative effects prevail, the fiscal impact of migrants might be different from that of the typical native on whom the European welfare states were originally designed.

In this article, we study the fiscal impact of immigration on the EU. For this purpose, we use EUROMOD, the tax-benefit microsimulation model for the EU that represents a unique tool for international comparative research on the effects of taxes and benefits. EUROMOD is based on detailed information at the individual level on taxes paid and benefits received contained on the European Union Statistics on Income and Living Conditions (EU-SILC). We complement the individual-level data with detailed information on in-kind benefits and indirect taxation. In this way we are able to provide a thorough assessment on the fiscal impact of migration. Additionally, contrary to the National Transfer Accounts approach (see e.g. Istenic et al. (2016)), our approach allows us to distinguish between natives, intra-EU and extra-EU migrants and account for the socio-economic factors, such as education or labour force differentials, that drive the difference in their net fiscal contributions.

We estimate the net fiscal impact for natives and migrants in two steps. First, we compute the present impact of migrants on state budgets and recover the average net fiscal effect of migration.

[1] According to the OECD, on average, EU MSs spent 23% of their GDP to fund their social security programmes in 2018. The average for the other non-EU OECD members was 18%. (Source: https://stats.oecd.org/Index.aspx?datasetcode=SOCX_AGG, last accessed 07/11/2019.)

Second, following the approach of Hinte and Zimmermann (2014), we estimate the life-cycle contribution of each population group.

By focusing on the whole EU and on three origin groups - natives, intra- and extra-EU migrants - our analysis goes beyond previous studies on the fiscal impact of immigration that focus on one country (Chojnicki and Ragot, 2016; Dustmann and Frattini, 2014; Storesletten, 2003) or on sub-populations only, such as intra-EU migrants (Nyman and Ahlskog, 2018). Rather, we are able to account for the different statutes governing welfare provisions across the EU and compute the fiscal positions for the whole population.

Our research is also quite unique in combining both 'static' and 'perspective' approaches allowing us to determine the extent to which differences in the age structure between migrants and natives determine their fiscal balance. The life-cycle approach can offer precious indications to policy makers on the possible evolution of the fiscal balance once recently arrived migrants will start to age approaching the age distribution of natives. Therefore, it also indicates a more long-term perspective of the net fiscal impact of immigration.

Our main findings can be summarized as follows: First, the average net fiscal impact (ANFI) for all three groups is negative, but natives show the highest imbalance, indicating that currently, the average immigrant is less costly in monetary terms for the state. Accounting for the demographic composition further increases the overall deficit for all groups, but improves the relative position of natives who in a life cycle contribute in net terms more than intra-EU migrants, who in turn exhibit a less negative net fiscal position than extra-EU migrants.

Second, we also find substantial differences across EU MSs regarding both concepts of the net fiscal impact. Most likely, this reflects the differences in types and history of migration characterizing the EU MSs. Especially in the traditional welfare states, differences in the net fiscal impact between natives and extra-EU migrants over the life cycle are substantial, while differences between natives and intra-EU migrants seem to be less pronounced.

The paper is organized as follows. In Section 2.2, we discuss the literature related to the fiscal impact of immigration focusing on the European context and the general immigration patterns in the EU. Section 3 describes the data and methodology that we use. In Section 4, we present the simulation results both from an EU perspective as well as from the perspective of each MS. Section 5 concludes and comments on our main results.

2. Background

2.1. Evidence on the fiscal impact of migration

The analysis of the fiscal impact of immigration in Europe has gained attention in recent years due to growing concerns about the sustainability of welfare states in a context of major demographic changes and challenges for Europe (Lutz et al., 2019).

The empirical evidence on this topic is mixed and depends largely on the economic context, the methodology adopted, as well as the characteristics of migrants. This literature adopts two main approaches: either static or dynamic. The static accounting approach captures a snapshot of public finances over one or more years by allocating the contributions made and benefits received between the native and immigrant populations. The results of static analyses largely depend on the demographic unit of analysis (individuals or households) and its demographic and socio-economic

characteristics as well as on the benefits and taxes covered and years analysed. The advantage of the static approach is that it does not require assumptions on future demographic trends or public spending. However, the results lack the forward-looking perspective that is increasingly required to inform public fiscal policy.

Usually, the fiscal impact of immigration is quantified as modest and on average below (+/-) 1% of the national GDP (Chojnicki, 2013). Studies using this approach find that the favorable demographic structure of migrants, skewed towards a younger and active population, advantages their fiscal position (Bogdanov et al., 2014; Dustmann et al., 2010; Chojnicki, 2013). The socio-economic factors influencing the fiscal impact commonly identified in the literature are the age at arrival in the host country,[2] the number of children in the family[3] and whether migrants are high-skilled (who generally contribute positively to the fiscal balance) or low-skilled (who typically have a less favorable fiscal position).[4]

Dynamic approaches typically focus on the entire life cycle. They can be classified in three groups: Net Present Value (NPV) Approach, Generational Accounting Analysis (GA) and Dynamic Applied General Equilibrium Model (DAGEM).

This evidence is forward-looking and the results depend heavily on assumptions over future developments of population and migration trends, government taxes and expenditures, or migrants' rights to access public services and benefits (Vargas-Silva, 2015).

Studies using an NPV approach have been conducted for example in Sweden, where Storesletten (2003) and Ekberg (2011) estimate a negative net contribution of immigrants. They estimate that immigration to a traditional welfare state such as Sweden typically causes a fiscal burden to the state, however this result crucially depends on the characteristics of migrants.[5]

Studies using a GA approach account for the intertemporal distribution of public debt (OECD, 2013). Evidence using this methodology is available for several countries while cross-country comparisons are rather scarce (Hinte and Zimmermann, 2014). Results show considerable variation, depending on immigration and integration policy, but in general tend to show a positive effect of increasing immigration flows on the tax burden of future native generations.[6] For Bonin et al. (2000), immigration generates a positive fiscal effect and reduces the fiscal burden of future generations in Germany; however, this effect is not enough to eliminate the future fiscal imbalance resulting from the ageing of the German population.[7]

[2]This is due to potential savings on education in young ages (Economics, 2018).

[3]E.g. Dustmann and Frattini (2014) estimate that migrants from European Economic Area (EEA) countries contributed positively to the UK public finances over the period 1995-2011, while the net fiscal impact of non-EEA migrants was negative. The higher number of children of non-EEA migrants may also explain these results as they represent a fiscal cost for the destination country.

[4]For Ruist (2014), a cohort of Bulgarian and Romanian migrants in Sweden contributed positively to the country's finances in 2011, however, the lack of language skills was an important barrier to entering the labour market. See also Christl et al. (2020).

[5]Storesletten (2003) attributes the negative effect that he encounters to migrants' difficult assimilation in the labour market. It has also to be noted that he finds a positive contribution for those aged 20-30 years. Similarly, Gustafsson and Österberg (2001) show the importance of labour market integration on the net fiscal impact of migration.

[6]See, e.g., Collado et al. (2004), Mayr (2005), Chojnicki et al. (2011), Chojnicki (2013) or Chojnicki and Ragot (2016).

[7]Other analyses that take into account the life cycle of immigrants show that greater fiscal gains can come from

The DAGEM approach addresses the economic impacts of immigration more broadly by considering direct and indirect effects. Adopting this methodology, Schou (2006) finds a positive effect of immigration in Denmark only for immigrants with immediate labour market integration, and a negative effect for other immigrants. Hansen et al. (2017) show for Denmark that immigrants from Western countries have in general a positive fiscal impact, while immigrants from non-Western countries have a strongly negative fiscal impact. The negative fiscal impact can be mainly attributed to weak labour market performance and early labour market exit. Finally, the comparative analysis by Berger et al. (2016) shows high heterogeneity in the results on the contribution of future immigration up to 2060, which largely depends on the volume of immigration and the institutional set-up of the host country.

2.2. Immigration in Europe: recent trends and characteristics

In recent years, most European countries have seen an increase in foreign-born individuals as a share of the total population. In 2019, Eurostat recorded 40 million people born outside the EU and residing in one of the 27 MSs plus the UK, and 22.4 million people born in an MSs other than their country of residence. Figure 1 shows the share of foreign-born population over the total population for each MS, distinguishing between intra- and extra-EU migrants. Evidently, the aggregate data hides a considerable heterogeneity between MSs. Luxembourg is the country with the highest share of population born elsewhere, as it hosts an exceptionally high number of foreign-born population, corresponding to a share of 47% of the total population. In this ranking, Luxembourg is followed by Cyprus, where 21% of the resident population is born abroad, and Malta and Austria whose shares of foreign-born populations are 20% and 19.2% respectively. We observe the lowest shares of foreign population in Central and Eastern European countries: in Slovakia, Poland, Bulgaria, and Romania less than 4% of the population is born abroad. Ireland, Cyprus, Luxembourg, Hungary, and Slovakia are the only MSs where intra-EU migrants are more than the extra-EU migrants.

As for the main indicators of labour market performance, the three groups differ substantially. According to Eurostat, in 2019, 80% of intra-EU migrants were active in the labour market, while this percentage dropped to 74% for natives and to 71.5% for extra-EU migrants. The unemployment rates tell a partially different story, according to which natives display the lowest rate (6.1%), followed by the intra-EU migrants (7.5%) and the extra-EU migrants whose unemployment rate across the union is as high as 12.5%, twice that of natives.

Both the unemployment rate and the activity rate are heavily influenced by the demographic structure of the three groups. In fact, only 62.6% of natives are of working age, compared to 71.4% of intra-EU migrants and as many as 81.7% of extra-EU migrants. The different demographic structure directly influences the activity rates of the three groups and it will affect the type of social security benefits that the three populations will rely on. We can expect that retirement benefits will accrue mostly to natives, while a comparatively high share of extra-EU migrants will receive unemployment benefits with intra-EU migrants being the group less reliant on social assistance due to their high activity rate and low unemployment rate.

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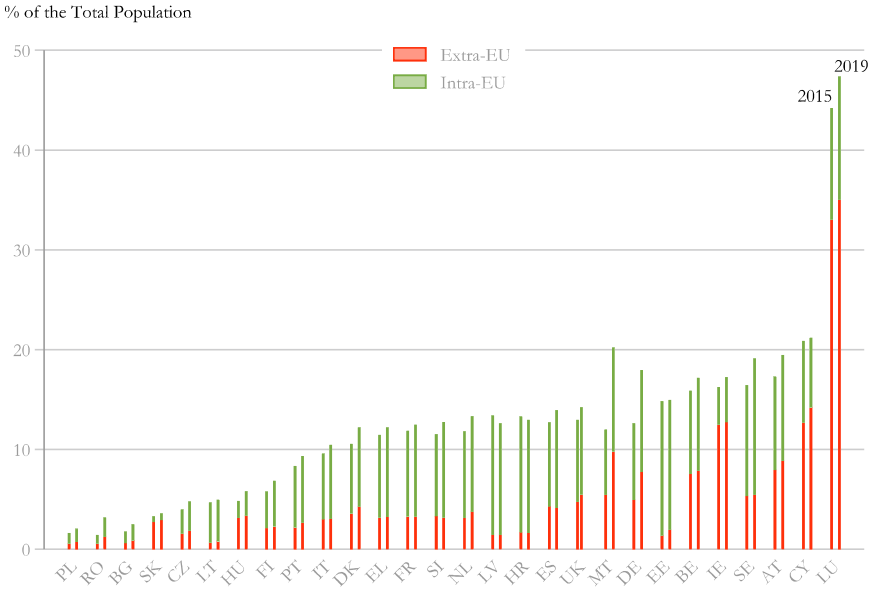
increasing the education levels of new immigrants, as suggested in Chojnicki (2013) for France. Hinte and Zimmermann (2014) show how the fiscal impact of immigration is positive when labour migrants account for the largest share of the migrant population.

Figure 1: Foreign-born population by country of birth, 2015 - 2019



Source: Own elaboration based on Eurostat data (online data code: migr_pop3ctb)

3. Data and methodology

3.1. Microsimulation modelling

We evaluate the fiscal impact of immigration using EUROMOD, the tax-benefit microsimulation model for the EU (see Sutherland (2007)) using individual and household data from the EU-SILC for 2015. We define migrants by country of birth and distinguish between intra-EU and extra-EU (born) migrants.[8] EUROMOD simulates individual and household tax liabilities and benefit entitlements based on the policy rules in place in each EU MS (see also Sutherland and Figari (2013)). EUROMOD is a unique tool for comparative research on the effects of taxes and benefits at the EU level as it calculates, in a comparable manner, the static effects of the tax-benefit system on household and individual incomes for each EU MS and for the EU as a whole. The data source used in EUROMOD is individual micro-data based on EU-SILC for 2015.[9]

The advantage of EUROMOD is that it allows us to assess policy changes over time, showing, for example, how changes in policies limiting eligibility for benefits to natives or intra-EU migrants contribute to reducing the net fiscal effects of extra-EU migrants, thus increasing poverty or income inequality across population groups. Additionally, EUROMOD allows us to aggregate benefits in a harmonized way across all EU countries. Baseline systems in EUROMOD are micro-validated, which means that the results of the simulations are close to the observed individual and

[8]Please note that given this definition of migrants, the second generation is not counted as migrants.

[9]Please also note that we use data from 2015, meaning that the latest migration wave to Europe is not covered in our data.

household information of the EU-SILC. Additionally, the baseline systems of EUROMOD are macro-validated based on information from external sources on expenditures and the number of benefit recipients.

For the purpose of this analysis, we supplement the core EUROMOD module with specific data and policies aimed at migrants following Fiorio et al. (2018). In particular, EUROMOD input data lacks information on the year of arrival of migrants in the host country. This information is key in at least two respects. First, the duration of stay in the host country is an important indicator of the integration of newcomers.[10] Second, several legislatures require minimum residence or contributory periods for eligibility to several benefits. We resolve this issue by resorting to the original EU-SILC data and merging it in the EUROMOD input data. In this way, we are able to establish migrants' length of stay in the country and, in turn, their entitlement to specific benefits.

For example, in many countries, unemployment benefits can only be claimed after a minimum mandated period of work. In our imputation, we assume that if the years of stay in the country are less than the legally mandated period no claim on the benefit can be made. One example might help clarify our procedure. In Italy, for example, eligible individuals for Ordinary Unemployment Benefit are employees who have paid (i) contribution against unemployment for at least two years or (ii) 52 weeks of contribution in the two-year period before the date of work suspension. We reflect this eligibility condition in EUROMOD by allowing only immigrants who are living in Italy for more than two years to claim the benefit.

In addition, there might be other types of non-mean tested benefits which cannot be given to immigrants. For example, the child benefit for Student Parent in Denmark is given to parents in tertiary education. extra-EU immigrants are not eligible for this benefit and this eligibility condition is reflected in EUROMOD specific to Denmark.

On the other hand, there are many mean-tested benefits policies that need modifications for incorporating the migrant component in EUROMOD. One of them is family benefit in Austria. For example, for receiving the family bonus in Vienna, the parents have to live in the same house with the child. Furthermore, at least one parent has to be an Austrian citizen and at the time of the child's birth needs to have his or her principal residence in Vienna for at least 1 year. Parents without Austrian citizenship need to have their principal residence in Vienna for at least 3 years. European Economic Area (EEA) citizens are equated with Austrian citizens. Another example of a mean-tested benefit is the newborn bonus in Italy introduced in 2015. The bonus corresponds to 80 euro per month for a maximum of three years given to "children of Italian citizens or of a Member State of the European Union and non-EU citizens with residence permits" per each child born before December 2015. It is subject to a means-test verified by using the ISEE (Indicator of Equivalent Economic Situation) which cannot be higher than 25,000 euro per year. If the ISEE is below 7,000 euro per year the amount of the bonus is 160 euro per month. As we cannot observe in the data whether an immigrant holds a residence permit, we assume that immigrants who entered Italy in the last five years are eligible for this child-related benefit.

Take up rates of benefits are not modified in the model. Importantly, due to the lack of information on eligibility requirements, not all benefits are simulated in EUROMOD (most prominently, pension benefits, since there is no contributory history in the EU-SILC data). In that case, data

[10] See, e.g., Sinn and Werding (2001).

regarding benefits are simply taken from the input data. Details can be found in the EUROMOD Country Reports.[11]

Lastly, to correct for the underrepresentation of migrants in the EU-SILC, we reweight the data following the procedure of Creedy (2004).[12]

3.2. *Imputation of in-kind benefits and indirect taxes*

Similar to standard micro-simulation models, EUROMOD is used for simulating direct taxes and cash benefits. However, a good part of income redistribution occurs through in-kind benefits which represent a fiscal cost for the public purse. The largest share of public in-kind transfers is related to health care, followed by education, child care, housing and active labour market policies.[13] According to the OECD Health Statistics 2020,[14] on average, OECD countries dedicated 8.8% of their GDP to health expenditure in 2018. On the other hand, indirect or consumption taxes are a substantial component in the country tax system. As shown in the OECD Revenue statistics 2020 for 2018, the total share of government revenue raised via consumption is about one-third, which is higher than the direct income tax.

Despite their significance for public budgets, in-kind benefits and indirect taxes are not simulated in EUROMOD due to the lack of direct information on expenditures and non-cash income in the underlying EU-SILC data. Therefore, we separately calculate indirect taxes and in-kind benefits and further merge them with the EUROMOD output data. More details on the modelling of in-kind benefits as well as indirect taxation can be found in the Appendix.

3.3. *Aggregated concepts of the net fiscal impact*

We add in-kind benefits and indirect taxation to individual income, following Figari and Paulus (2015) who use indirect taxes, imputed rent and in-kind benefits to replace the standard disposable income (DI) concept by an extended income (EI) concept.

The extended income concept uses the original income of an individual i ($ORIGY_i$) and subtracts direct taxes ($SSC_i + TIN_i$) and indirect taxes ($+VAT_i$) while adding all the cash benefits received ($BUN_i + BPEN_i + BRESTI_i$) as well as the in-kind benefits ($BINK_i$). Equations (1) and (2) highlight the differences between both approaches.

$$DI = ORIGY_i - (SSC_i + TIN_i) + (BUN_i + BPEN_i + BRESTI_i) \tag{1}$$

$$EI = ORIGY_i - (SSC_i + TIN_i + VAT_i) + (BUN_i + BPEN_i + BRESTI_i + BINK_i) \tag{2}$$

where SSC_i is the social security contributions, TIN_i is the taxes paid on income, and VAT_i is the value-added tax (VAT) paid by individual i. To the contribution side, we subtract cash benefits

[11] See https://euromod-web.jrc.ec.europa.eu/using-euromod/country-reports.

[12] In this procedure, reweighting is based on household-level data, changing the sample weights for migrants to adjust for underrepresentation.

[13] See https://www.oecd.org/tax/revenue-statistics-2522770x.htm.

[14] See https://www.oecd.org/health/health-expenditure.htm.

BUN_i (such as unemployed benefits), pension benefits $BPEN_i$, other cash benefits $BREST_i$ (such as family benefits) as well as in-kind benefits $BINK_i$.

We define the net fiscal impact (NFI) for an individual i as the difference between the taxes paid and the transfers received:

$$NFI_i = (SSC_i + TIN_i + VAT_i) - (BUN_i + BPEN_i + BREST_i + BINK_i) \tag{3}$$

We introduce two concepts to estimate the net fiscal impact of migration at the country and at the aggregate EU level. First, to estimate a snapshot of the current net fiscal impact, we calculate the $ANFI^j$ by migration status j, which we define as the average NFI_i^j of all individuals i with migration status j:

$$ANFI^j = \frac{\sum_{i=1}^{N} NFI_i^j}{n} \tag{4}$$

Second, to quantify the life-cycle impact, we calculate the life-cycle deficit (LCD) according to migration status j, and assume that an individual has the ANFI of the specific age group over his or her life cycle (0 to 80 years). We define the LCD by migration status j as:

$$LCD^j = \sum_{age=1}^{80} \frac{\sum_{i=1}^{N} NFI_i^{age,j}}{n} \tag{5}$$

Where $\frac{\sum_{i=1}^{N} NFI_i^{age,j}}{n}$ is the ANFI of each age group, age, and migration status, j. We then sum up the age groups from 0 to 80 (in 5-year bands), to obtain an estimate of the life-cycle impact by migration status. In other words, we assume that each demographic group has an ANFI at each age and calculate the life-cycle contributions of all three migration statuses. In our model the age-specific NFI is calculated and the summed up by migration status. This approach ignores possible age effects stemming from differences in the age structure.

3.4. Discussion of data imputation

Several assumptions and simplifications are made when estimating NFI. Therefore, one has to be cautious when interpreting these results. First, while many monetary benefits received by the individual are directly observable in our micro-data, in-kind benefits are not. In-kind benefits account for a large share of public expenditures. Ignoring these benefits altogether would have rendered our imputations severely incomplete. For this reason, we have decided to resort to additional data sources even when these sources contained only partial information. In particular, data on health expenditures are only available by age group without distinction by origin in the OECD Health Statistics. We assign in-kind health benefits based on age. Consequently, we are assuming that migrants and natives of the same age will benefit from public health care in the same manner. There is ample evidence that this might not be the case as migrants tend to under-use this type of public service. Our imputation for this item will overestimate public expenditure on migrants. Nevertheless, in-kind benefits on health, education and social housing account for about two-thirds of total expenditures. Additionally, we do not consider expenditures for public goods and services related to child care and elderly care although in some EU countries they account for a large share

of total expenditures. Such non-consideration may lead to another source of limitation as there is evidence that migrants use less public care services than natives do. Other public good expenditures such as those related to public transportation are not considered but they are likely to be equally provided to migrants and natives.

A second important issue is the imputation of indirect taxes. We impute taxes based on Household Budget Survey (HBS) data accounting for differences in savings and consumption rates between natives and migrants. However, in countries where information of country of birth is missing, like Finland, Slovenia, Latvia, Lithuania and Greece, saving rates and consumption patterns are assumed to be equal between natives and migrants as long as the disposable income and household structure is the same. This is unlikely to be true in practice. There are indications that migrants save more and it is reasonable to assume that many of them will spend at least a share of their disposable income in their country of origin and send part of their income to their original country. If this is the case, we possibly overestimate the VAT payed by migrants in their host country.

4. Results

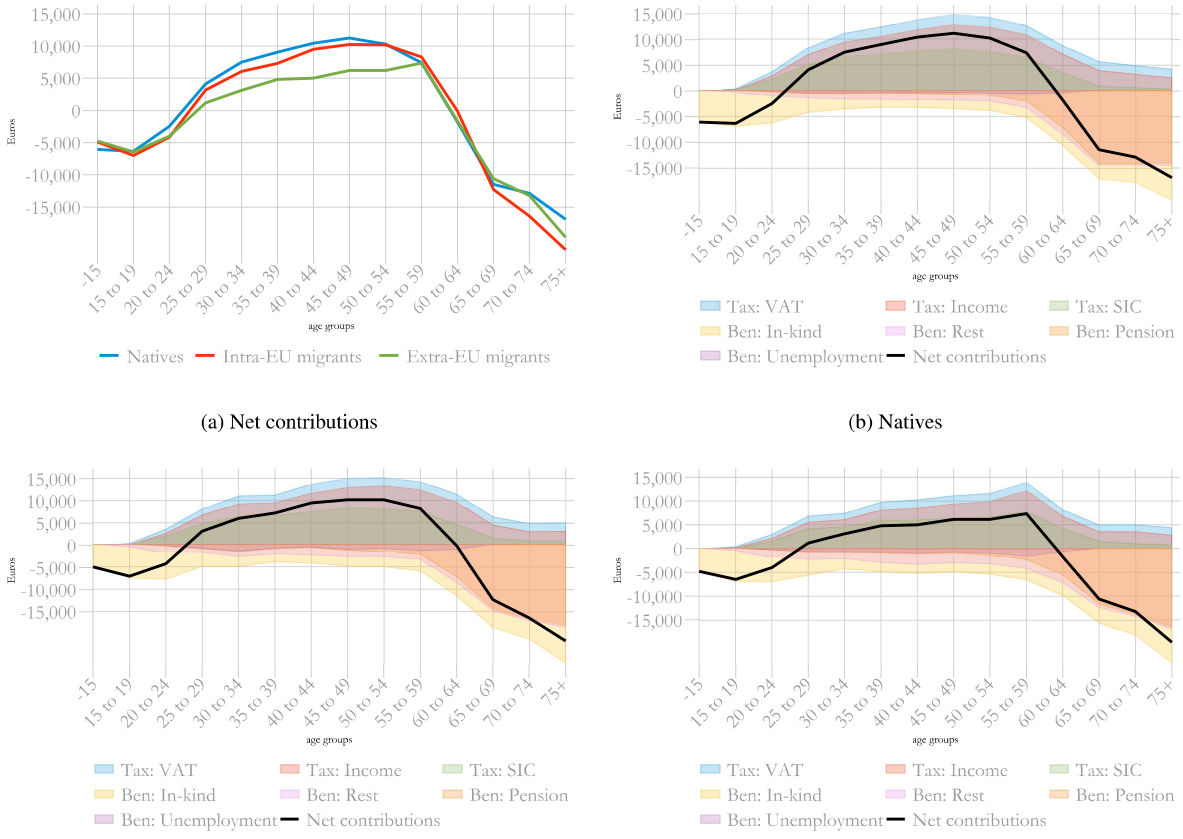
This section discusses the pattern of the individual NFI simulated as explained above. First, we discuss the results at the EU level and more specifically show how the estimated average net fiscal contributions vary by cohort (age), gender and educational level. Next, we adopt a life-cycle approach based on several simplifying assumptions and perform a comparative analysis of NFI at the country level.

4.1. The European perspective

Here we describe the patterns of the net fiscal contributions and the tax benefit components by cohorts, gender and education level, separately for natives, extra-EU migrants and intra-EU migrants, at the EU level. Figure 2a shows a large variation in net fiscal contributions between cohorts as well as between natives and migrants. Overall, the net fiscal balances are positive and monotonically increase with age until a person's late fifties and become negative and decrease thereafter. The positive peak in net contributions is reached faster for natives compared to migrants and coincides with the general retirement age. For most of the working life time span, the per capita contributions of natives are higher than those of intra-EU and extra-EU migrants. This pattern reflects earnings' differences between natives and migrants, which, in turn, is related to differences in their labour market participation and wages.

Decomposing the net fiscal effect by its main components and by migration status as shown in Figures 2b, 2c and 2d reveals that expenditures for pensions and other old-age related benefits account for a very high share of social expenditures. Conversely, social security contributions (including Social Security Contribution for pension) account for the highest share of fiscal contributions, followed by taxes on income and taxes on consumption. When comparing natives with extra-EU migrants, three noticeable facts emerge: (1) natives contribute more than extra-EU migrants in income taxes; (2) pensions amounts are higher for natives than extra-EU migrants; (3) social transfers are higher for extra-EU migrants than natives. The first and second facts can be

Figure 2: Net fiscal contributions by migration status in the EU



(a) Net contributions

(b) Natives

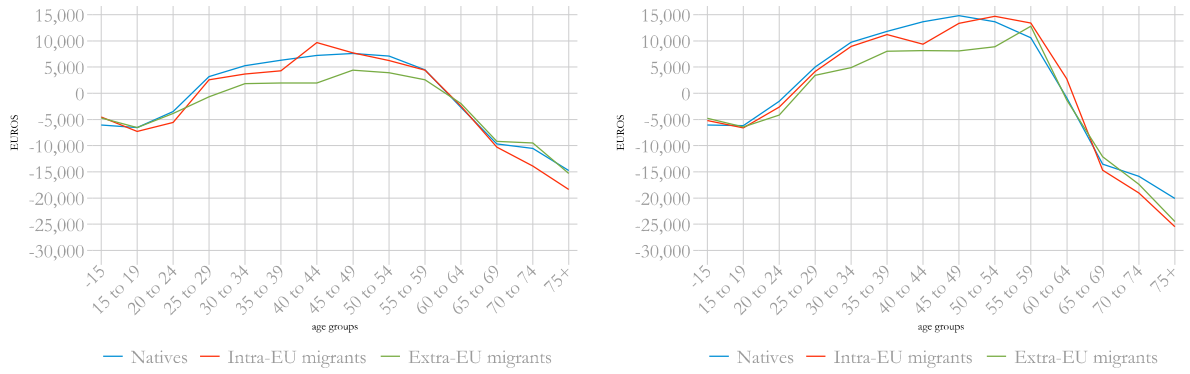
(c) Intra-EU

(d) Extra-EU

readily explained with natives' higher current wages and past social security contributions, respectively. The third fact is mostly explained by differences in socio-demographic characteristics, such as number of children or people employed within a family and so on.

Looking at gender differences, Figure 3, we can see that women generally have lower net fiscal contributions during their working age time span most likely because of the unequal share of unpaid work in most European countries and a persistent gender gap in labour force participation. This also results in lower pension entitlements and therefore a less negative impact of net fiscal contribution, on average. Again, natives and intra-EU migrants tend to have a similar NFI for both genders over the life cycle. On the other hand, the NFI of extra-EU migrants is found to be lower, but the gender gap between natives and extra-EU migrants is almost null.

Figure 3: Net fiscal contributions by migration status and gender in the EU



(a) Females

(b) Males

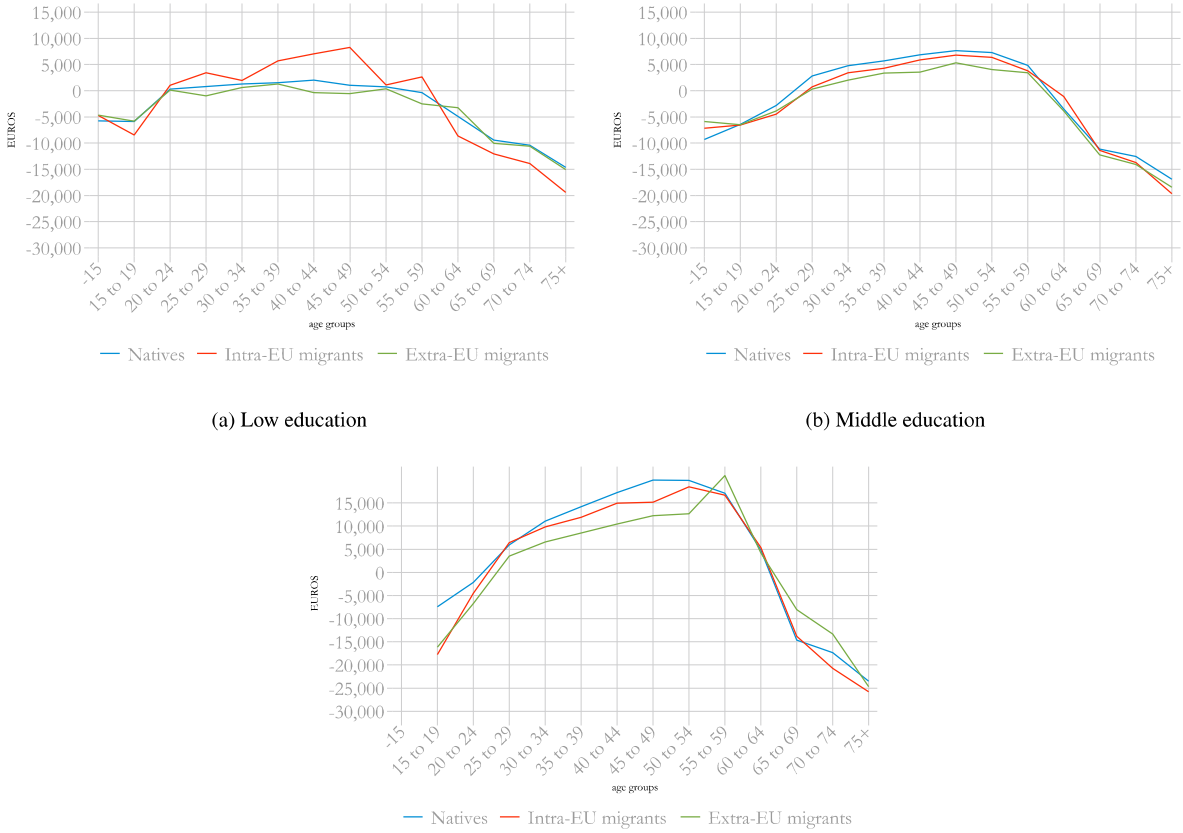
Finally, we decompose the net fiscal effects by three levels of education. As shown in Figure 4c, there are no significant differences in net fiscal effects between highly educated migrants and natives. In fact, the shape of the net fiscal contributions is very similar. The picture looks very different for lower educated individuals, shown in Figure 4a: natives and extra-EU migrants behave in a very similar way, while intra-EU migrants do not. Indeed, intra-EU migrants contribute much more than the rest of population and consequently are entitled to higher pensions.

4.2. The net fiscal impact over the life cycle

An analysis of the average net fiscal effect of migrants can reveal useful information on the current impact of migrants on the public budget. However it does not help reveal any element on their contribution over their lifetimes. As argued by Hinte and Zimmermann (2014), only analysing the net fiscal effects of immigration for one fiscal year alone leaves out an important part of the picture. A life-cycle perspective approach could help to add additional information on the long-term impact of migration.

When comparing the results attained under both concepts, the ANFI and the LCD, it can be seen that at the EU level migrants have a negative ANFI (-208 euro for intra-EU and -219 euro for extra-EU), although higher than natives (-476 euro). This means that 2015 migrants are less of a burden on the EU public budget than natives. However, when looking at the aggregate LCD

Figure 4: Net fiscal contributions by migration status and education in the EU



(a) Low education

(b) Middle education

(c) High education

estimate (controlling for age structure), it can be seen that the fiscal impact is less negative for natives (-723 euro) than for intra-EU migrants (-1106 euro) and extra-EU migrants (-2411 euro). These numbers suggest that the negative fiscal impact of migrants over the life cycle is expected to be more than that of natives.

Table 1: Average net fiscal impact and life-cycle deficit in the EU in euro, 2015

	ANFI	LCD (0-80)	LCD (0-75)	LCD (0-85)
Natives	-476	-723	208	-1825
Intra-EU	-208	-1106	46	-2411
Extra-EU	-219	-2600	-1622	-3799

There are several reasons for the higher magnitude of negative life-cycle impact as compared to the ANFI. First, the life-cycle impact is estimated by selecting a sample from the age of 0 to the age of 80 (80.6 years was the official average life expectancy in 2015 in the EU). However, migrants may have different mortality rates than natives. As a a robustness check, we also add LCD estimates for different age limits (75 years and 85 years). We can see that if we assume a

lower age limit, the LCD turns positive, at least for natives and intra-EU migrants. However, the LCD for extra-EU migrants stays negative. When assuming an age limit of 85, the LCD turns substantially more negative.

Second, this approach controls for different population weights. Currently, in most countries, more people are of working age (15-64) and thus on average net contributors, while fewer people are young (0-15) and older (65 and more), people who are usually net recipients. When using an average indicator, such as the ANFI, this obviously has an impact on the fiscal outcome. For the LCD, however, those differences do not matter.

The differences between ANFI and LCD indicators clearly stand out. When we take a look on the ANFI, migrants tend to have a better NFI for the state than natives. However, when we focus on the LCD, migrants, and especially extra-EU migrants, exhibit a substantially higher deficit than natives, which stems from their more favourable age structure which the ANFI estimates do not control for. Focusing on the long-run fiscal impact of migration, the LCD might be the more interesting concept, while focusing on the immediate impact on the welfare state, the ANFI might be the indicator of interest.

4.3. Country-specific differences in ANFI and LCD

In this section we discuss the current ANFI of migrants at the country level. In addition, we compare these static impacts with country-specific estimates derived from the LCD approach.

Figure 5 shows the ANFI for all MSs. It can be observed that in Austria, Belgium, Spain, Finland, Denmark, the Netherlands, Ireland, Italy and Portugal the current fiscal impact of intra-EU migrants is higher than for natives. In addition, in countries, such as Austria, Cyprus, the Czech Republic, the Netherlands, Denmark, France, Italy and Portugal, ANFI is higher even for extra-EU migrants as compared to natives. There are also substantial differences between intra-EU and extra-EU migrants.

However, these results can be driven by the age structure of the three sub groups. Therefore, we also analyse the LCD related to our three groups of interest. As expected, those results are substantially different to the ANFI. Again, results on the country level show different patterns across different MSs. Figure 6 highlights substantial differences across the different migration statuses when looking at the LCD.

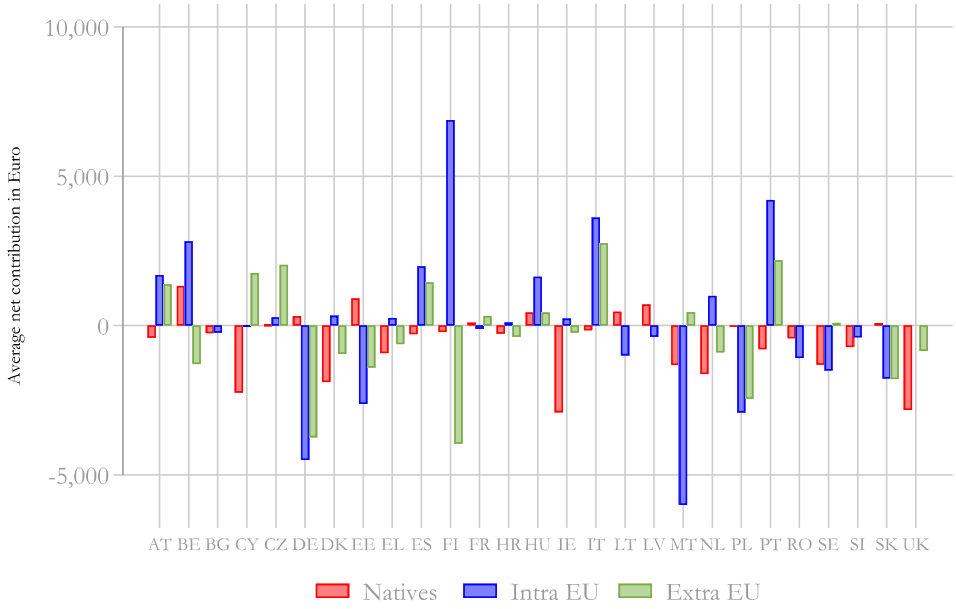
In general, figures on LCD of natives and intra-EU migrants are often quite similar. However, in some countries, such as Belgium and some Eastern European countries, the NFI of intra-EU migrants over the life cycle is even higher than for natives.

Extra-EU migrants typically show a significantly higher LCD than natives and migrants. Looking further in the data, it can be seen that this is mostly related to their lower labour market participation. Especially in the traditional welfare states, such as Austria, Belgium, Denmark, Finland, the Netherlands and Sweden, differences in the NFI between natives and extra-EU migrants (but also differences across intra-EU and extra-EU migrants) over the life cycle are substantial.[15]

One has to be cautious when interpreting these results. The LCD approach does not account for the fact that many first-generation migrants have attained their education level in their country

[15] Please note that in most of the Eastern European countries, extra-EU migrants are a very small group, which leads to substantial uncertainty in our results.

Figure 5: Average net fiscal impact (ANFI) by country and migration status

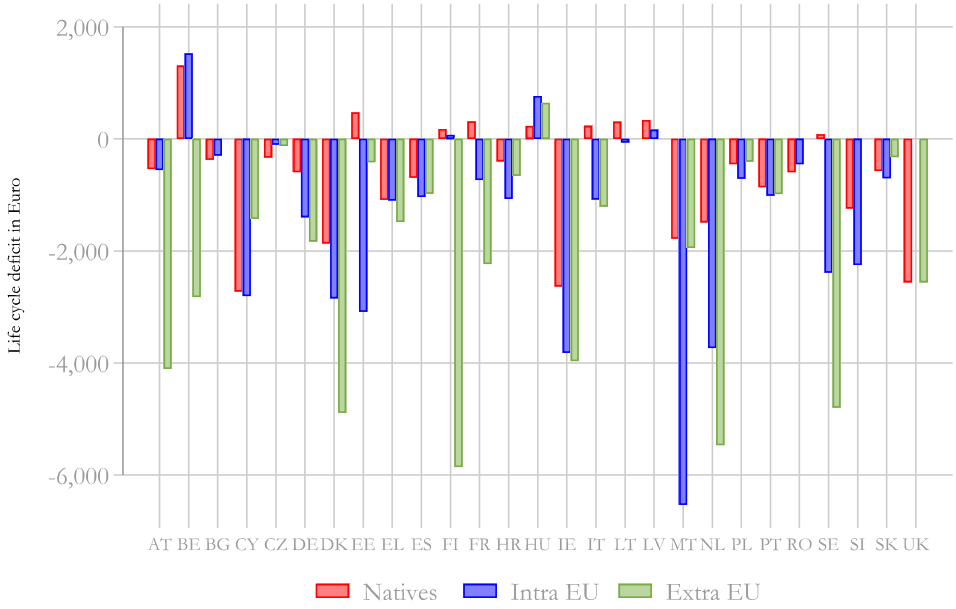


Note: In some countries, intra-EU and extra-EU migrants are combined into one group due to data limitations.

of origin. This means that educational costs of migrants are often not payed by the host country. Therefore, ignoring them would lead to an overestimation of the average costs in young ages of migrants and an increase of the LCD estimated for migrants.

Figure D.7 in the Appendix highlights the differences in the net contribution by migrant status in all EU MSs over the life cycle.

Figure 6: Life-cycle deficit (LCD) by country and migration status



Note: In some countries, intra-EU and extra-EU migrants are combined to one group due to data limitations.

5. Conclusion and discussion

There is a long-lasting discussion on the NFI of migration. For decades, economists and especially policy makers have been asking whether a more favorable account balance is expected from migration. In other words, whether the expenditures on benefits, pensions and other social security services could be more or less balanced by revenues collected in the form of taxes and social security contributions. Our paper tackles this question by estimating the NFI for natives and migrants using detailed micro-data from the EU-SILC.

To compute the NFI of migration, we extend the EU-SILC data in several ways. First, we take into account indirect taxes and in-kind benefits. Second, we add VAT taxes by simulating VAT rules using the HBS to take into account the different consumption patterns of migrants and natives. Third, we enrich the EU-SILC with information on in-kind benefits, based on OECD statistics that allow us to apportion the cost of education, social housing and health care provisions among individuals.

In this paper, we combine static microsimulation modelling with a life-cycle approach to estimate long-term implications of migration, following Hinte and Zimmermann (2014). To this end we exploit EUROMOD to calculate two concepts of NFI: the average net fiscal effect that reveals the current impact of migrants on the state budgets; and the life-cycle contribution to obtain an estimate on long-term implications. Our results suggest that when considering the ANFI, both intra-EU and extra-EU migrants have a negative but higher NFI than natives. This means that, currently, the average immigrant is less of burden on the public budget than the average native.

However, this result might be influenced by the difference in the demographic composition of each group. To account for the impact of demographic composition of the three groups, we control for age structure and obtain an estimate of NFI over the life cycle. The estimates indicate that the net fiscal contributions appear to be even more negative over the life cycle although natives show a higher contribution than intra-EU migrants, who in turn exhibit a higher (less negative) NFI than extra-EU migrants.

Additionally, we find that there are substantial differences across EU MSs regarding the net fiscal impact of migration, in both concepts. This potentially reflects the differences in types and history of migration characterizing the EU MS. Especially in the traditional welfare states, such as Austria, Belgium, Denmark, Finland, the Netherlands and Sweden, differences in the NFI between natives and extra-EU migrants over the life cycle are substantial, while differences between natives and intra-EU migrants seem to be less pronounced. This diverging picture attracts attention to the ongoing problems of integration (especially of labour market integration) related to extra-EU migration and suggests that better (labour market) integration might prove to be the key to improve the NFI of migrants.

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Appendix A. Tax and benefit disaggregation

Tax and benefit systems differ substantially across EU Member States. Nevertheless, EUROMOD allows us to aggregate all the benefits and taxes in each country in a comprehensive way. By taking advantage of this aggregation feature of EUROMOD, we aggregate the calculated outcome variables into several categories according to the nature of the variables themselves. On the government expenditures side, we have information about the following cash benefits received by every individual in the survey:

- family and child benefits, which include child care and child education, family, maternity and parental leave benefits;
- health and health-related benefits and pensions, which include accidents, receiving care, caring, disability and health benefits, disability and health pensions;
- housing benefits and pensions, which include housing, heating and municipality benefits;
- old age and age-related benefits and pensions, which include old age, survivors and early retirement benefits, civil servant, minimum, old age, survivors and early retirement pensions;
- work-related benefits, which include unemployment and work-related benefits;
- social assistance benefits and pensions, which include social assistance and military benefits;
- social insurance contributions.

In terms of direct benefits received, we therefore aggregate the benefits to the following categories:

- "BENEFITS: unemployment": Covers all unemployment benefits (contributory, as well as non-contributory) as well as work-related benefits;
- "BENEFITS: pension": Covers all pension benefits (survivor pensions, old-age pensions);
- "BENEFITS: rest": Covers all the additional benefits, such as family benefits, health benefits, housing benefits and social assistance benefits.

  On the government revenue side, we have information on income and other types of taxes as well as on social security contributions. We aggregate them as follows:

- "TAXES: on income": Covers all taxes on income sources (labour income, capital income, property income and other specific taxes such as church, health, municipal, pension insurance, wealth and early retirement tax) that are simulated in EUROMOD;
- "TAXES: social insurance contributions": Covers all social security contributions paid by the employer, the employee and the self-employed.

To calculate the final net contribution of individuals we subtract the sum of all benefits received from the individual from the contributions (income taxes and social insurance contributions) made:

- "NET Contributions (contributions - benefits)": Covers all individual contributions net of benefits received.

Appendix B. Imputation of in-kind benefits

EUROMOD output was complemented with information on VAT by simulating VAT rules using the HBS to take into account the different consumption patterns of migrants and natives. Additionally, EUROMOD was extended to include restrictions imposed by tax-benefit policies based on the residence or the citizenship status. Finally, the EUROMOD output was enriched with data on in-kind benefits, based on the OECD data for apportioning the cost of education social housing and health care provision (Fiorio et al., 2018).

Below, we describe the imputed in-kind benefits and the method of imputation. In-kind benefits are calculated based on EUROSTAT aggregate statistics on expenditures on health, education and social housing and then apportioned based on observed information. We identify recipients of in-kind benefits related to social housing (at household level) and education (at individual level) in the micro-data.

For in-kind health benefits, we assign them according to age groups in the micro-data based on the OECD statistics on the distribution of total cost for public health care. Nevertheless, this imputation method does not account for the potential difference in use between natives and intra-EU migrants and extra-EU migrants. In fact, there is a wide range of literature dedicated to the 'health immigrant effect' from a time path perspective. It says that the health of immigrants is substantially better than that of comparable natives just at arrival at the host country but deteriorates with the duration of migration. The 'healthy immigrant effect' is attributed to a number of factors. Self-selection of immigrants is one of these factors based on which healthier people are more likely to immigrate. On top of that, an important factor may be the underutilization of health care services by immigrants. There are studies showing that health care services are underutilized by migrants due to a lower skill level of health literacy, language difficulties for asking for the appropriate health care, lack of trust in medical structures or cultural barriers or discrimination reasons. Also sorting immigrants into more dangerous occupations appears to be a factor for the deterioration of health status among immigrants.

There are three types of in-kind benefits monetarized in this study: (1) health-related benefits, (2) education-related benefits and (3) social housing benefits.

- Health-related benefits are calculated based on EUROSTAT information on general government expenditure in 2014. Such expenditures include medical products, appliances and equipment (01), outpatient services (02), hospital services (03), public health services (04), R&D in health (05), health for non-specified categories (06). The average per capita expenditure on health is apportioned by age groups based on the OECD statistics on the distribution of total cost for public health care by age class for the Netherlands in year 2011 (OECD, 2017), assuming that this is representative of distribution of health care expenditure across the EU countries by age classes, and that this distribution does not change over time. These assumptions are somehow strong but this is the only information available on general health costs by age classes in the EU area.

- Education-related benefits are calculated based on EUROSTAT statistics on the total public expenditure on education per full-time equivalent student by education level and type of program (EUROSTAT database), which is available for most EU countries for year 2014. The

total education expenditures are apportioned based on the observed information on the education level in the micro-data and are then assigned to the child in education. For some countries (Czech Republic, France, Ireland), the dataset for 2013 is used (as the 2014 dataset was missing), and uprated to be 2014 equivalent by using the country-specific consumer price index, assuming no expenditure change in real terms. For countries with missing information (such as Croatia for all levels of education and Denmark for primary and secondary education), other available sources are used (EUROSTAT educ-uoe-enra02 database, namely Pupils and students enrolled by education level, sex and age, and EUROSTAT educ-uoe-fine02 database, namely Public educational expenditure by education level, programme orientation, type of source and expenditure category) and per capita expenditure are computed as the ratio between total expenditures over the number of students/pupils by educational level. For countries without any information on education expenditure, such as Croatia and Greece, the per capita expenditures are calculated as a weighted average of similar countries normalized by per capita GDP. For example, for Greece, the average of education expenditures of three southern European countries (Italy, Spain and Portugal) is used to proxy the per capita educational expenditure while for Croatia, the information on Romania, Bulgaria and Slovenia is considered.

- Social housing benefits are calculated based on Classifications of the Functions of Government (COFOG) database on the total amount spent by public authorities or public institutions for housing and community amenities, which include housing development, community development, water supply, street lighting, R&D housing and communities amenities. We then use EU-SILC-provided information regarding the tenure status of households to obtain an estimate of the number of individuals living in social housing, which is used to compute an estimate of the average cost of social housing in each EU country. Again, the in-kind benefits for social housing are further assigned to the household head.

Appendix C. Modelling of indirect taxes

To additionally account for indirect taxation, we include information on household expenditures from the HBS from 2010 (latest available data). The HBS dataset contains detailed information on household expenditures for several EU countries. The HBS is a sample survey where the statistical units of interest are private households. It is carried out regularly under the responsibility of the National Statistical Offices in each EU MS. The countries provide information about household final consumption expenditure on goods and services with considerable detail in the categories used, plus information on income and some additional demographic and socio-economic characteristics. Please note, that there is a great freedom for each MS to decide on the objectives, methodology, programming and resource allocation for their respective HBS.

The VAT is a consumption tax that aims to tax the sale of goods and services to the final consumer along the whole supply chain. It is defined as a percent of the purchase price, including potential other taxes or excises. Theoretically, the tax burden is borne by the end consumer but there are several reasons why businesses sometimes bear some of it. For example, some services are exempted from VAT, which means that the service provider cannot recover the VAT paid on

the inputs needed to provide exempted services (e.g. health care). Additionally, businesses are restricted from deducting certain inputs (e.g. corporate gifts or inputs not used for business activity). Consistent with the literature and for simplicity, we assume that the end consumer (the households) are bearing the whole VAT burden.

In most countries goods can be taxed at the standard rate, the reduced rates, the zero VAT rate or can be VAT exempted. We take information on what goods are taxed at what rate in each MS from the 'Worldwide VAT, GST and Sales Tax Guide 2015' of Ernst and Young that reports detailed information on indirect taxes around the world. This guide summarizes the VAT, goods and services tax and sales tax systems in 122 jurisdictions. We use for our simulations the information on tax laws for 2015. Our result should be interpreted as a rough approximation for the VAT tax burden, keeping in mind that the information on detailed consumption of goods and services, as well as information on the taxation of certain goods and services, are not complete.

The general framework for the VAT systems of the EU MSs is based on the EU VAT Directive, which obliges EU Member States to have a VAT rate of at least 15% and allows for reduced rates for a certain categories of goods and services. MSs have therefore a wide flexibility in setting the VAT rates, leading to substantial differences in the national VAT systems. Most of the consumption in the EU countries is taxed by a standard VAT rate. This standard VAT rate varied substantially across EU countries in 2015, from 17% in Luxembourg to 27% in Hungary. Additionally, on certain products, a reduced VAT rate applies. Typically food is taxed with a reduced rate. Some countries have even more than one reduced VAT rate. Luxembourg and France had in total four different VAT rates in 2015. In addition to those rates, many countries have exempted some goods and services from VAT. Typically this are financial services, health services and education.

Additional taxes, so-called excises, are typically added on some goods, such as alcohol, gasoline, diesel, oil or cigarettes. In our model, we focus purely on the VAT, leaving excises out of the model. This is mainly due to the fact that excises are often based on the amount rather than on the price of a certain good (such as tobacco). In our data, we can only observe the expenditures related to the goods. Therefore calculating the excises in a proper way is not possible.

In general, the VAT on products varies substantially across the MSs. But also the group of goods and services are taxed at a reduced rate or those that are exempted from VAT differs substantially between countries. Quite detailed information on the consumption behaviour is needed to estimate the VAT paid by households. Even though the HBS data is quite detailed, there are some limitations in identifying the expenses that are taxed on a reduced rate or exempted from VAT. We try to cover those categories as good as possible, but obviously there are some limitations in our approach that might lead to slight over- or under-estimation in the VAT.

Based on HBS data, indirect taxes are simulated for all European countries and cover all the applicable VAT rates - the standard VAT rates and the main reduced rates for the year 2015. Excises (applicable to goods consumed by households) are not included in the analysis. The calculations of the VAT cover the standard rate, the reduced rates, the zero VAT rate and the VAT exempted goods. Since we assume full pass through of indirect taxes on to the consumer, the model does not distinguish between a zero rate and VAT exemption.

In a first step, we analyse consumption patterns of natives and migrants. The HBS, similar to the EU-SILC dataset, contains information on citizenship as well as country of birth, split in three groups: national, non-national but EU-national, non-national and extra-EU-national for most

of the countries. For consistency, we again define migrants by country of birth. By simulating the indirect taxation, we can see not only that migrants and natives show different consumption patterns, but also different indirect tax burdens. On the one hand, migrants tend to save more, therefore consuming less and paying less VAT. On the other hand, migrants often have lower incomes and those groups typically bear a higher share of indirect taxes. Therefore it is important to distinguish between migrant and native households, when implementing the indirect taxation in our data set.

We assume that the VAT burden of the household is split according to the household income share of the household. Therefore we are able to calculate the individual VAT burden. By using simple regression methods, we estimate the VAT burden of households, depending on the overall income of the household, as well as on socio-demographic characteristics, such as migration status, household type, number of children and so on. We use the estimated parameters to impute the VAT burden of households in the EU-SILC data. There are different methods to impute the VAT burden in the EU-SILC data (see e.g. Decoster et al. (2010)), but since the main interest in this research falls on the average VAT burden by age groups and immigration status, we argue that implementing VAT rates in this way is the most convenient. In the literature, VAT rates are often implemented on an aggregated level by income deciles (see e.g. Dustmann and Frattini (2014)). The method used in this research has an advantage over standard approaches as we do not lose in heterogeneity and maintain the micro-level structure. This allows us to distinguish between different expenditure and saving behaviour between migrants and natives.

We face several data issues when imputing the VAT behaviour from the HBS in EU-SILC. First, countries like Austria and the Netherlands are not included in the HBS 2010 wave. Therefore, the imputation of VAT is done based on other data sources or imputation methods. For example, for Austria we use the national HBS of Statistics Austria for 2009/2010 and the Indirect Tax Tool of the Commission to calculate VAT taxes for all households. On the other hand, for the Netherlands, we follow the approach used by Dustmann and Frattini (2014) using information on effective VAT rates by income quintile (Bettendorf and Cnossen (2014)) to impute the VAT tax burden of households. Both these imputations do not permit us to distinguish between migrant and native consumption patterns as no information is available on the country of origin. Second, for Italy, information on income is missing in the HBS. Therefore we impute the VAT assuming a constant saving rate of 10.52 as reported by EUROSTAT for the year 2015. Lastly, due to problems with the income data in the HBS for Luxembourg, Luxembourg is not considered in this research.

Table C.2: In-kind benefits for health in euro (yearly per person)

age group	AT	BE	BG	CY	CZ	DE	DK	EE	EL
0 to 5	1262	1190	132	254	489	1008	1732	320	298
5 to 10	1001	944	105	201	388	800	1374	254	236
10 to 15	1407	1327	148	283	545	1124	1932	356	332
15 to 20	1492	1406	156	300	578	1192	2048	378	352
20 to 25	1650	1556	173	332	639	1318	2265	418	390
25 to 30	1861	1755	195	375	721	1487	2555	471	440
30 to 35	1927	1817	202	388	747	1539	2645	488	455
35 to 40	1905	1796	200	383	738	1521	2614	482	450
40 to 45	1970	1858	207	397	763	1574	2705	499	465
45 to 50	2250	2122	236	453	872	1798	3089	570	531
50 to 55	2583	2435	271	520	1001	2063	3545	654	610
55 to 60	2962	2793	311	596	1148	2366	4066	750	700
60 to 65	3303	3114	346	665	1280	2639	4534	837	780
65 to 70	4191	3951	439	843	1623	3348	5752	1062	990
70 to 75	5209	4911	546	1049	2018	4161	7151	1320	1230
75 to 80	7095	6689	744	1428	2749	5667	9739	1797	1675
80+	14211	13398	1490	2860	5505	11352	19507	3600	3356
	ES	FI	FR	HR	HU	IE	IT	LT	LU
0 to 5	553	1281	1090	279	219	1389	726	280	2030
5 to 10	438	1016	864	221	174	1101	576	222	1610
10 to 15	616	1428	1215	311	244	1548	810	312	2264
15 to 20	653	1514	1288	330	259	1641	858	331	2400
20 to 25	723	1675	1425	365	286	1816	950	366	2655
25 to 30	815	1889	1607	412	323	2048	1071	413	2994
30 to 35	844	1956	1664	426	334	2120	1109	428	3100
35 to 40	834	1933	1645	421	330	2096	1096	423	3064
40 to 45	863	2000	1702	436	342	2168	1134	437	3170
45 to 50	985	2284	1943	498	390	2476	1295	499	3621
50 to 55	1131	2621	2230	571	448	2842	1486	573	4155
55 to 60	1297	3007	2558	655	514	3260	1704	657	4766
60 to 65	1446	3352	2852	731	573	3634	1900	733	5314
65 to 70	1835	4253	3619	927	726	4611	2411	930	6742
70 to 75	2281	5287	4498	1152	903	5732	2997	1156	8381
75 to 80	3106	7200	6127	1569	1230	7806	4082	1574	11414
80+	6222	14423	12272	3143	2463	15636	8177	3153	22863
	LV	MT	NL	PL	PT	RO	SE	SI	SK
0 to 5	183	486	1377	221	409	130	1293	492	458
5 to 10	145	385	1092	176	324	103	1026	390	363
10 to 15	204	542	1535	247	456	145	1442	549	511
15 to 20	217	574	1627	262	483	154	1529	581	542
20 to 25	240	635	1800	289	535	170	1691	643	599
25 to 30	270	717	2030	326	603	192	1908	726	676
30 to 35	280	742	2102	338	624	199	1975	751	700
35 to 40	276	733	2078	334	617	197	1952	742	692
40 to 45	286	759	2149	346	638	203	2020	768	716
45 to 50	327	866	2455	395	729	232	2307	877	817
50 to 55	375	994	2817	453	837	267	2647	1007	938
55 to 60	430	1140	3231	520	960	306	3036	1155	1076
60 to 65	479	1272	3603	579	1070	341	3385	1288	1199
65 to 70	608	1613	4571	735	1358	433	4295	1634	1522
70 to 75	756	2005	5682	914	1688	538	5339	2031	1892
75 to 80	1030	2731	7739	1244	2299	732	7272	2766	2576
80+	2063	5471	15501	2492	4604	1467	14566	5540	5160

Source: Fiorio et al. (2018)

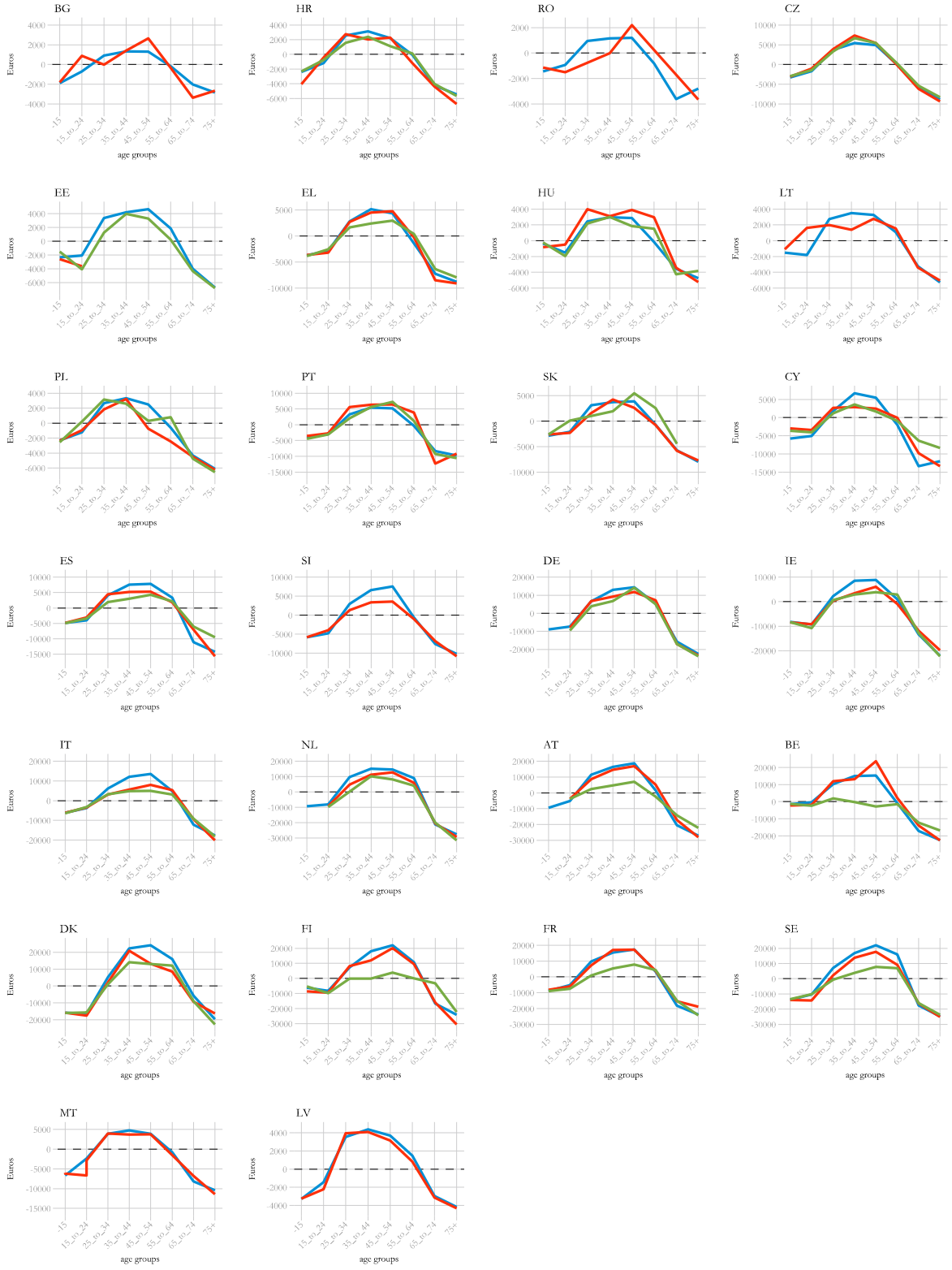
Table C.3: In-kind benefits for education in euro (yearly per country on current education level)

Education level	1	2	3	4	5	6
AT	6894	8808	11928	11426	11426	13960
BE	6101	7976	9898	10823	10823	13825
BG	1868	1370	1537	1314	1314	1275
CY	2715	6630	8017	8134	8134	7420
CZ	2316	2249	3728	3260	3260	3154
DE	6662	6412	7898	8693	8693	14090
DK	10079	11798	13412	16185	16185	34809
EE	2666	3052	3254	3396	3396	5283
EL	2572	3432	4249	4130	4130	4470
ES	3427	3996	5071	5430	5430	6319
FI	9897	7952	12511	8543	8543	18236
FR	5841	5734	7870	10250	10250	11151
HR	2027	2095	2095	1950	1950	2318
HU	2675	1557	1610	3465	3465	2938
IE	5358	6418	8308	10292	10292	10329
IT	4082	5694	6276	6278	6278	7009
LT	1905	2304	2214	2611	2611	3563
LU	17526	17422	18625	17649	17649	25670
LV	2607	3237	3227	3432	3432	3580
MT	4900	5306	7849	5953	5953	10344
NL	6221	6751	9553	9128	9128	15194
PL	2028	2750	2829	2376	2376	3367
PT	2769	3972	5306	4674	4674	4594
RO	927	681	1233	1153	1153	1965
SE	13267	10390	11221	12449	12449	26975
SI	4433	4985	5570	4349	4349	5621
SK	2355	2792	2880	3088	3088	4942

Source: Fiorio et al. (2018)

Appendix D. Additional graphs

Figure D.7: Net contribution by country and migration status



Note: In some countries, intra-EU and extra-EU migrants are combined to one group due to data limitations.

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