Chapter 6

Immigrants' contribution to public finance

The present chapter seeks to determine whether immigrants pay more or less in taxes than they generate in public expenditures in a given year, and what sources account for outcome differentials across countries. The first section provides a general overview of public finances in the partner countries in comparison to other developing countries. The second section explains the methodology and presents the main results of the analysis. The third section discusses how immigrants' education and labour market characteristics affect their fiscal impact. Finally, the conclusions summarise the main findings and discuss their policy implications.

The public debate in many countries of destination tends to focus on the costs of immigration. In this respect, policy makers and public opinion are often concerned by the impact immigrants (foreign-born individuals) may have on public budgets and whether they "over use" public services such as schools, hospitals and public housing. The fear exists that immigration might lead to future tax increases or that the native-born population might have less access to these public services because of immigrants. An additional concern is that the quality of public services suffers because they are over-utilised. This is particularly the case for access to schools and quality education in areas with a strong concentration of foreign-born populations.

Despite the importance of the debate, evidence on the impact of immigration on both the fiscal balance and the quality of public services is missing for developing countries. Yet, this topic is especially relevant for low- and middle-income countries, as their budgets are often limited. Their revenues may not be sufficient to provide the basic public services required for a state apparatus to function. Immigrants who use more resources than they contribute would therefore put further pressure on public budgets. On the other hand, any immigration-related boost to the public budget would be welcome under these fiscal circumstances.

In fact, just as immigration usually raises overall gross domestic product (GDP) (see Chapter 5), it also contributes to increasing overall public revenues, but not always a sufficient amount to offset rising public expenditures. If the revenue increases that immigrants create are smaller than the additional expenditures governments undertake to accommodate them, then immigration translates into a net fiscal drain. In contrast, if revenues generated by immigrants surpass the expenditure they require, immigrants are positive net fiscal contributors.

Research on the fiscal effects of immigration in OECD countries shows that the net impact varies from country to country, from year to year and from immigrant group to immigrant group. In this respect, a recent cross-country analysis concludes that the net fiscal contribution of immigration, whether positive or negative, is usually less than 0.5% of GDP (OECD, 2013). The positive impact on public budgets tends to be higher when a larger share of the foreign-born is labour immigrants rather than humanitarian immigrants, when they are younger and when they have high employment rates. This chapter presents a similar analysis for nine partner countries. The tenth, Thailand, was largely omitted due to insufficient data.[1]

Public finance in partner countries

Most partner countries have public finance characteristics that are typical for low- and middle-income countries. Their public revenue shares are similar to respective averages for other countries with those income levels. And, as elsewhere, most have increased their revenues and expenditures in recent years.

Public revenue shares have been rising

Figure 6.1 shows that the public revenues (excluding grants) of partner countries broadly align with most low- and middle-income countries (Figure 6.1).[2] At 14.3% and 14.9% of GDP, respectively, the 2010 revenues of the two low-income countries, Nepal and Rwanda, slightly exceed the 13.6% average for low-income countries. Similarly, the revenues of the lower-middle-income partner countries all surpass the respective average of 15.7% of GDP: 15.8% in Côte d'Ivoire, 16.7% in Ghana and 19.4% in Kyrgyzstan. Among the upper-middle-income countries, some have below-average revenues – the Dominican Republic (13.9%), Argentina (17.7%) and Thailand (19.0%) – while others have above-average revenues – Costa Rica (23.1%) and South Africa (28.1%). For the latter, revenues even exceed the average for OECD countries, which represents 23.8% of GDP.

Figure 6.1. The public revenue shares in partner countries are predominantly low compared to the OECD average

Public revenue (% GDP), 2010
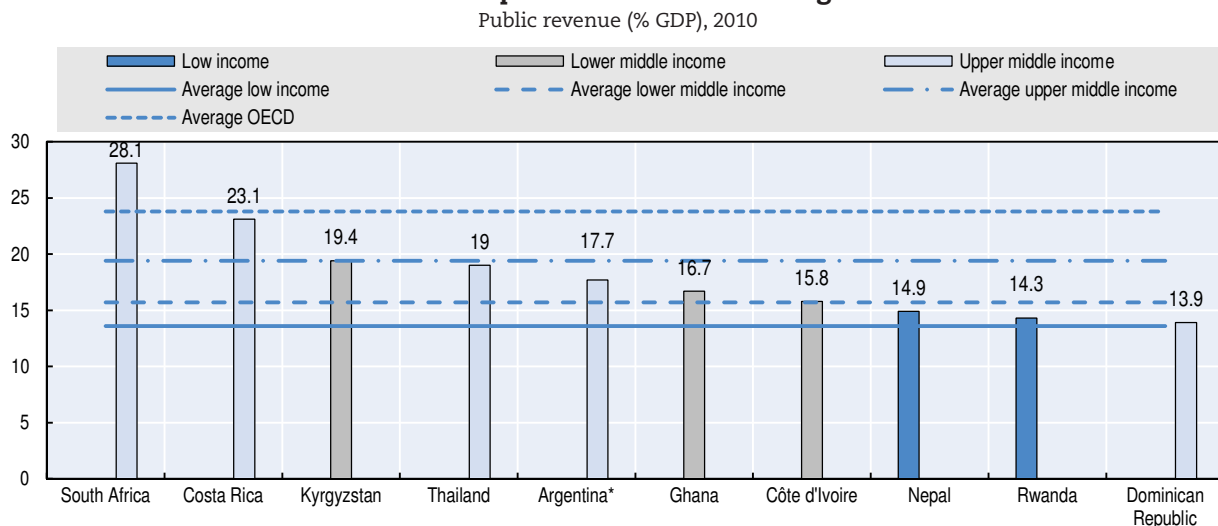
Note: Revenue is cash receipts from taxes, social contributions and non-tax revenues such as fines, fees, rent, and income from property or sales. Grants are also considered as revenue but are excluded. * For Argentina, the information is from the Statistical Yearbook.

Source: World Bank, *World Bank DataBase* (undated) based on the International Monetary Fund (IMF) *Government Finance Statistics Yearbook* and data files, World Bank and OECD GDP estimates and INDEC (2015). *https://data.worldbank.org/indicator/GC.TAX.TOTL.GD.ZS*.

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Most partner countries have grown their revenues as a share of GDP between 1990 and 2010. In five of the countries – Costa Rica, the Dominican Republic, Ghana, Kyrgyzstan (1993-2010) and South Africa – the increase was around a third or less. In Rwanda, revenue increased by slightly less than two-thirds; and in Argentina, it increased by as much as 266% (from 4.8% to 17.7%). The 1990 revenue share in Argentina was particularly low due to the high inflation rates (CIAT, 2017). The exceptions to the general increase are Thailand, where the decrease was below 3%, and Côte d'Ivoire, where revenues dropped by around 20% (from 1995 to 2010). For Côte d'Ivoire, 1995/96 represented a high point in public revenues (IMF, 2000) which has not been attained again since 2005; in 2011 revenues reached a low point due to the political-military crisis.

The rising public revenue trend is also observed in other countries. Thanks to an endogenous feedback loop between economic development and governments' taxation capacities, the level of taxation in an economy tends to go up as a country transitions from being a low to a high-income country (Besley and Persson, 2013). In Latin America and the Caribbean (LAC), the unweighted average for tax revenues increased from 13.9% in 1990

to 19.4% in 2010. The rising trend followed significant fiscal instability and high inflation throughout the 1980s. In response, during the 1990s many LAC governments focused on reducing inflation and stabilising public budgets by lowering expenditures (for example by privatising social protection systems, health care and education) and stabilising revenues (for example by introducing a value added tax). After 2000, some of the increases in tax revenues were driven by higher prices of export commodities (OECD/ECLAC/CIAT, 2012).

A selected number of African countries also saw an increase in tax revenues after 2000 (OECD, 2016). Tax reforms were identified as one of the underpinning factors for this trend. The opposing trend in Côte d'Ivoire occurred partially because of the repeated crises the country underwent. For example, the revenue to GDP ratio dropped from 14.3% in 2010 to 10.9% in 2011 (World Bank, undated).

In Asia, the average tax revenue as a percentage of GDP increased as well. Between 2008 and 2012 period, tax revenue was two percentage points higher than the 1998-2002 period (14.8% instead of 12.6%). It was about one percentage point higher than the 1993-1997 period (13.7%) (Aizenman et al., 2015).

Low-income partner countries rely heavily on indirect taxes

Countries situated at the lower end of the per-capita income spectrum often rely heavily on indirect taxes, such as taxes on goods and services and on imports and exports. This trend is also perceptible among partner countries. In all of the low-income and lower-middle-income countries, the share of indirect taxes in the sum of total taxes and social security contributions exceeds 57% and even reaches 78.2% in Nepal (Figure 6.2). In contrast, four of the five upper-middle-income countries have lower indirect tax shares, ranging from 57.0% at the upper end in Thailand to 39.7% at the lower end in South Africa. The Dominican Republic is the exception with an indirect tax share of 72%.

The pattern concerning the contribution of taxes on international trade are less clear cut. Two countries with relatively more elevated per-capita incomes – Costa Rica and South Africa – generate below 4% of their revenues through these taxes. But in Argentina and the Dominican Republic, at 8-12%, the shares are relatively comparable to two of the lower-middle-income countries, Kyrgyzstan and Rwanda, at 13% and 10% respectively. However, the lowest-income countries in the sample – Côte d'Ivoire, Ghana and Nepal – generate an excess of 20% of their public revenues through taxes on international trade.

Countries with lower income levels generally rely more heavily on indirect taxes than direct taxes (Besley and Persson, 2013). In part, this is because these taxes are relatively easy to administer compared with the more complex personal or corporate income taxes. In addition, the integration of countries into the global economy is often accompanied by a reduction of trade barriers, hence a reduction of trade-based tariffs (Aizenman et al, 2015).

Countries that raise a high share of taxes as a percentage of GDP tend to generate much of this revenue through income taxes; however, this is not always the case among the partner countries. The two countries with the highest fiscal revenue as a share of GDP – Costa Rica and South Africa – also have the highest combined share generated through direct taxes and social security contributions. But Kyrgyzstan, which has the third highest fiscal revenue as a share of GDP, generates less than one-third through these taxes and contributions. Rwanda, with the second lowest revenue as a percentage of GDP, generates almost 43% of these revenues through these taxes and contributions.

The size of the informal economy may influence tax revenue. The informal economy is defined here as all legal economic activities that are deliberately hidden from authorities. By

its very nature, determining its size and even defining what activities fall within its scope is not an easy exercise. Based on a model of the size of the informal economy (Hassan and Friedrich, 2016),[3] Thailand is estimated to have the largest informal sector and Argentina the smallest relative to their overall output among the partner countries (Figure 6.3). Thailand is in fact an outlier for a country at its income level, while the informal sector sizes of other countries are relatively typical.

Figure 6.2. **In many low- and middle-income countries, indirect taxes represent a significant share of revenues**

Distribution of fiscal revenues across major categories, 2010
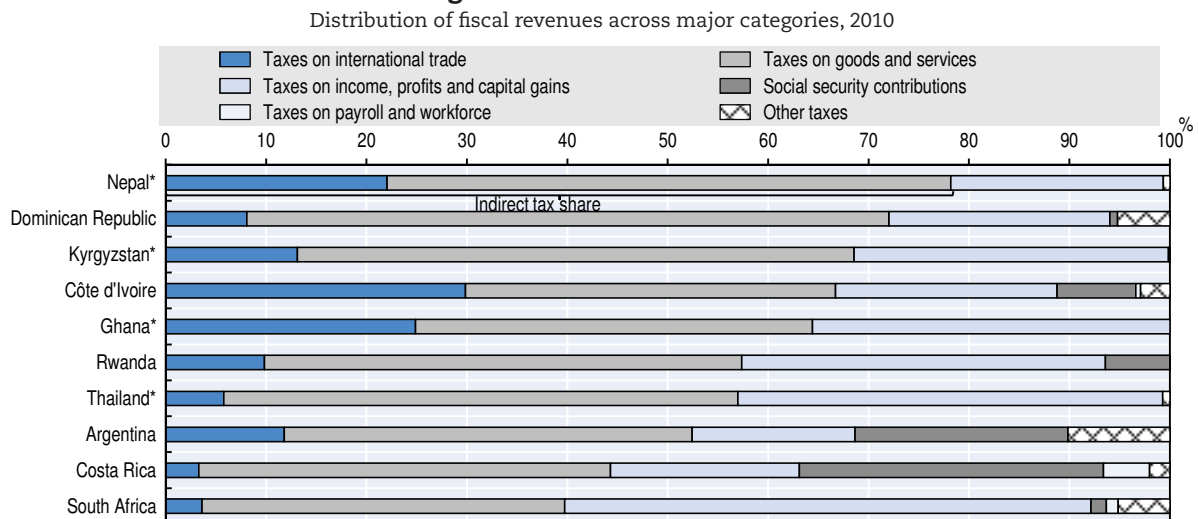
Note: For Ghana, Kyrgyzstan, Nepal and Thailand, the shares were calculated based on data from the IMF *Government Finance Statistics Yearbook* as presented in the *World Bank DataBase* (World Bank, undated). The shares as a percentage of public revenues of the international trade, income, goods and services, and other taxes are divided by the sum of these shares (thereby excluding grants and other revenues).

Source: OECD/ATAF/AUC (2016), OECD/CIAT/IDB/ECLAC (2016) and World Bank, *World Bank Databank* (undated), *https://data.worldbank.org/*.

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Analyses often identify informality based on the share of companies that are not registered or who have unregistered workers. Recent ILO data suggest that 32% (South Africa) to 49% (Dominican Republic) of non-agricultural employment in partner countries for which the data are available is informal (ILO, 2012).

Some countries are attempting to address the problem of the lack of revenues that often arises from a large informal sector. For example, Ghana (as well as Peru and Senegal) has tried to levy direct taxes on informal enterprises. These attempts had mixed success (Joshi and Ayee, 2008). Aside from direct taxes, there is an ongoing debate as to what extent indirect taxes cover the informal sector (Boadway and Sato, 2009). Overall, the effect of informality on tax revenues may be restricted because informal enterprises' profits are often so low that they would fall below tax thresholds (IMF, 2011).

Public expenditures have generally risen

The size of public expenditures as a share of GDP varies largely in partner countries. It is small in Côte d'Ivoire, the Dominican Republic, Nepal and Rwanda. Their expenditures are below the average for countries with low incomes (Figure 6.4). In contrast, the expenditure share in South Africa exceeds the average share for OECD countries. This has been partially attributed to the need for social and infrastructure investments in the post-Apartheid period (Idenyi et al., 2016).

Figure 6.3. **Most partner countries have shadow economies estimated at 30-43% of their GDP**

1999-2013 average shadow economy (% GDP)
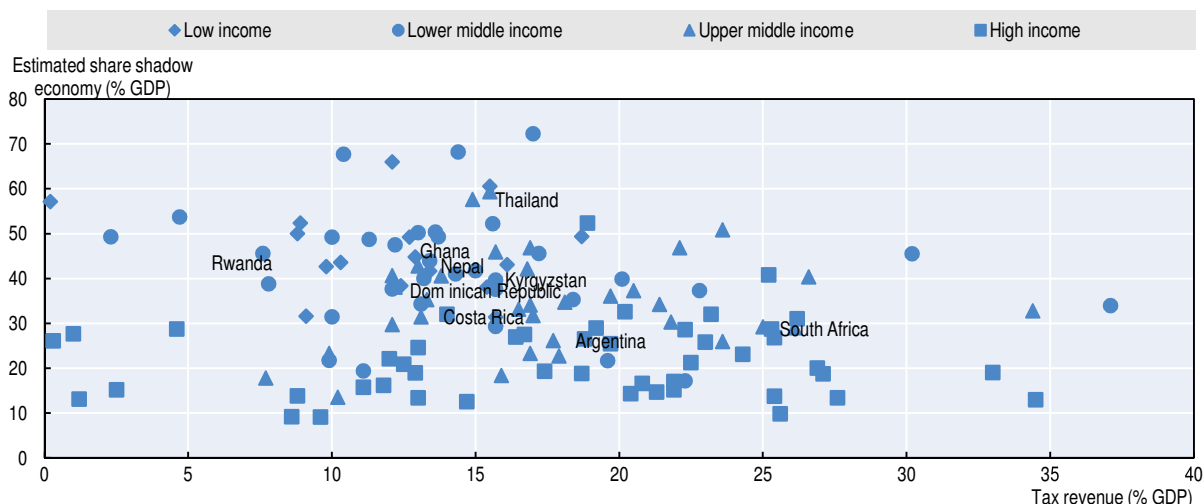
Source: Data for the estimated share of the shadow economy is taken from Hassan and Friedrich (2016) and tax revenue as a share of GDP from the World Bank, *World Bank DataBank* (undated), *https://data.worldbank.org/indicator/GC.TAX.TOTL.GD.ZS*.

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The data have gaps but, overall, many of the partner countries appear to have rising public expenditures. Those which had higher expenditures in 2010 than in 2000 were Costa Rica, the Dominican Republic, Kyrgyzstan, South Africa and Thailand. With the exception of Kyrgyzstan (for which information for 1990 is missing) and South Africa, expenditures had already increased between 1990 and 2000. For Rwanda, there was also an increase from 2010 compared to 1990. For Nepal and Ghana, earlier data were missing and compared to 2005, there was little change. Moreover, with the exception of Ghana (where data are unavailable) and Kyrgyzstan, expenditures had increased once again by 2013-15.

Figure 6.4. **Côte d'Ivoire, the Dominican Republic, Nepal, Rwanda and Thailand have low expenses**

Expenses (% GDP), 2010
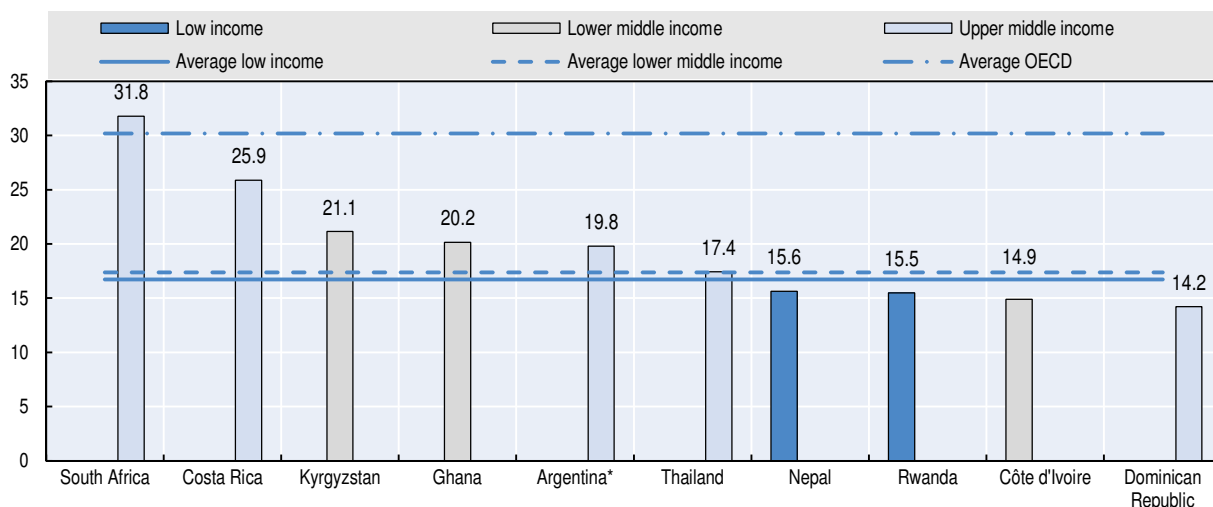
Note: Expenses are cash payments for operating activities of the government in providing goods and services. They include compensation of employees (such as wages and salaries), interest and subsidies, grants, social benefits, and other expenses such as rent and dividends.
* Information from the *2013 Statistical Yearbook* (INDEC, 2015). Averages for upper-middle-income countries and middle-income countries overall were not available.

Source: INDEC (2015) and World Bank, *World Bank DataBase* (undated), *https://data.worldbank.org/indicator/GC.XPN.TOTL.GD.ZS*.

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The composition of public expenditures varies according to national income levels

Some of the partner countries devote a high share of government expenditures to subsidies and other transfers. This is particularly true for Argentina and South Africa, where in 2010 this share exceeded the OECD average (Figure 6.5). In contrast, Costa Rica, Côte d'Ivoire, the Dominican Republic, Ghana and Thailand spent more than one-third on the compensation of employees. Interest payments ranged from 2.9% to 15.5% of public expenditures.

Figure 6.5. **In partner countries, subsidies and transfer payments tend to rise with per-capita gross domestic product**

Government expense (%), 2010
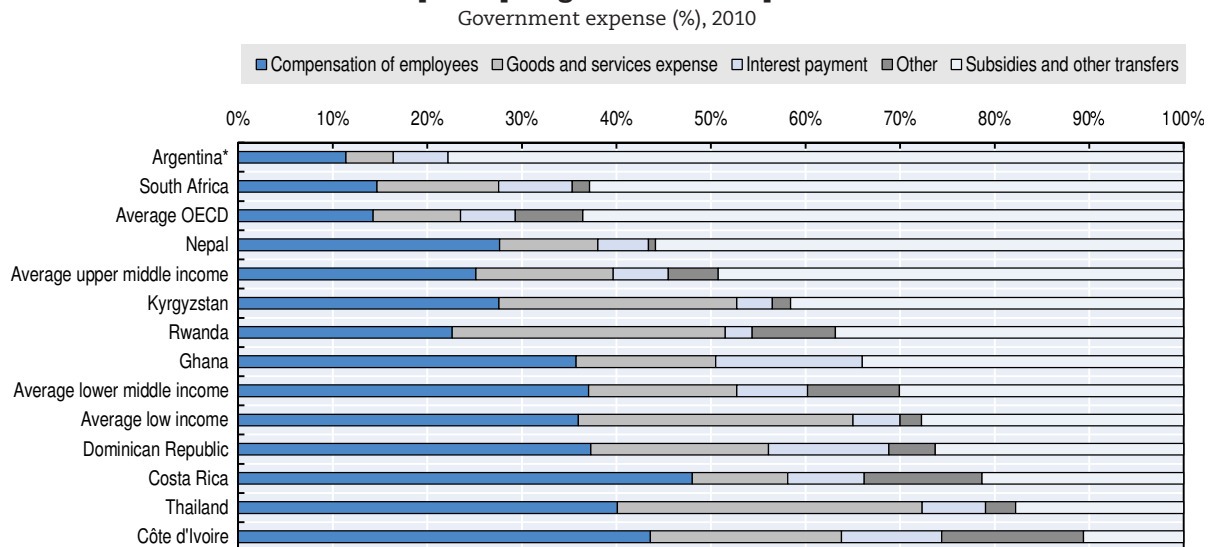
Note: Compensation of employees consists of all payments in cash, as well as in kind (such as food and housing), to employees in return for services rendered, and government contributions to social insurance schemes such as social security and pensions that provide benefits to employees. Goods and services include all government payments in exchange for goods and services used for the production of market and nonmarket goods and services. Interest payments include interest payments on government debt – including long-term bonds, long-term loans and other debt instruments – to domestic and foreign residents. "Other" expenses are spending on dividends, rent and miscellaneous expenses, including provision for consumption of fixed capital. Subsidies, grants and other social benefits include all unrequited, non-repayable transfers on current account to private and public enterprises; grants to foreign governments, international organisations, and other government units; and social security, social assistance benefits, and employer social benefits in cash and in kind. The sum of the shares for the country groups only added up to 85-95% of expenses. They were normalised to add up to 100%.

* For Argentina, the allocation is based on the *2013 Statistical Yearbook* (INDEC, 2015). The total expenses that are considered include all current expenditures as well as capital transfers, excluding direct real and financial investments. Remunerations are taken as compensation of employees; consumption expenditures on goods and services as goods and services expenses; interest payments as property rents; other consumption expenditures and other current expenditures as other expenses and social security payments, current transfers, and capital transfers as subsidies and other transfers.

Source: World Bank, *World Bank database* (undated) and INDEC (2015).

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Upper-middle-income countries tend to devote a higher share of their expenditures to the three major categories of social spending – social security, health and education – than countries with lower income levels (Figure 6.6). The exception is Kyrgyzstan, which has only recently transitioned to a lower-middle income status, but devotes the highest share of its expenditures to these three categories. This can be explained by the legacy of its pension scheme with universal coverage from the Soviet era. Interestingly, and despite its middle-income status, Nepal also devotes a quarter of its government expenditures to education.

Figure 6.6. **Partner countries with higher per-capita income usually spend over a third of public expenditures on social security, health and education**
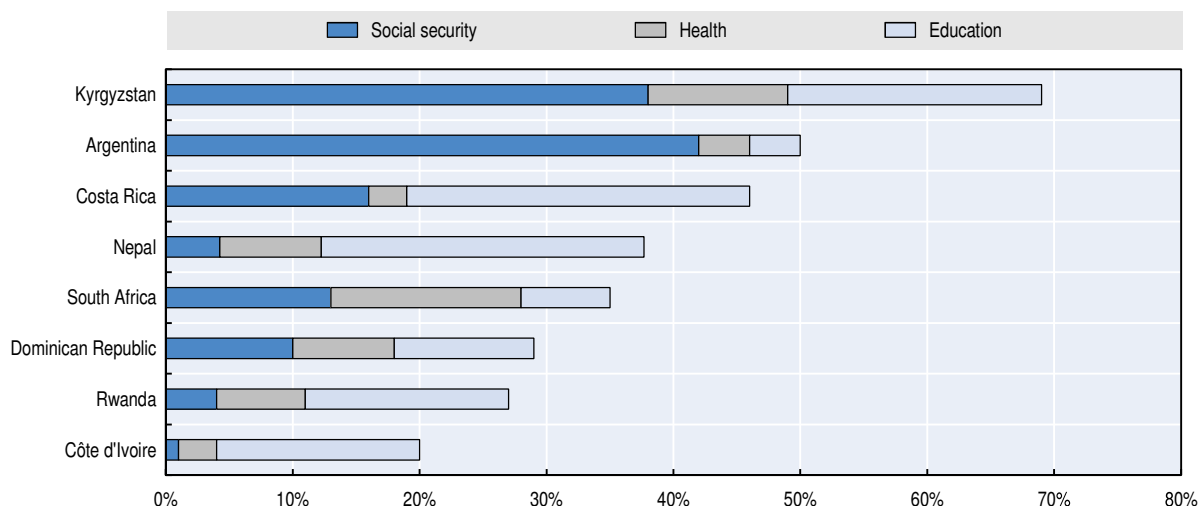
Note: This figure is based on the latest years for which the fiscal analysis was carried out: 2013 for Argentina, Costa Rica, Kyrgyzstan and Rwanda, 2011 for Nepal and South Africa, 2008 for Côte d'Ivoire and 2007 for the Dominican Republic. Ghana is not included because data on certain security expenditures, such as personnel-related costs in public health and education, are not listed separately in the country's classification of public expenditures.

Source: Authors' own work based on government budget data (see the chapter's appendix).

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Pension systems vary across countries, which partially explains their different shares in public expenditures. Several countries combine various elements. For example, Kyrgyzstan's pension system has contributory and non-contributory components, with defined-benefit and defined-contributions plans (Bogomolova, 2014). Argentina similarly has non-contributory and defined-benefit contributory pension components (OECD, 2015). Costa Rica has defined-benefit and defined-contribution as well as non-contributory elements (OECD/IDB/World Bank, 2014). Ghana currently has a three-tier system for private and public sector employees with defined-contribution and defined-benefit components (Social Security and National Insurance Trust, undated). Several countries have flat-rate taxes for elderly individuals that may have to fulfil residency or citizenship requirements. This is the case for Nepal (Social Security Administration, 2011) and South Africa (OECD, 2015). The Dominican Republic has a defined-contribution plan that guarantees a minimum pension for non-public employees (OECD/IDB/World Bank, 2014). Rwanda (Rwanda Social Security Board, undated) and Thailand (Social Security Administration, 2011) have defined-benefit plans without a minimum pension. Côte d'Ivoire's systems currently only cover public and formal sector employees (CLEISS, 2016).

Concerning social protection payments, comprehensive programmes that cover the majority of the population for unemployment and sickness remain rare outside of upper-middle and high-income countries (ILO, 2014). Low- and middle-income countries generally provide only disability and old-age insurance.

Measuring the direct fiscal contribution of immigrants

The estimates presented in this chapter are based on a static accounting approach that measures the net fiscal contributions of the foreign- and native-born populations in a single year. This section first describes how the approach compares to other methods and then presents the results of the estimation.

The methodology chosen is the accounting approach

There is a variety of methodologies to measure the fiscal impact of immigration. These include static analyses, in principle the accounting approach, and dynamic analyses including net transfer profiles, generational accounting and macroeconomic models. An overview of the characteristics, advantages and drawbacks as well as of the results of key studies for the four methodologies below is provided in OECD (2013). Each methodology measures a different scope of the fiscal impact:

● The **accounting approach** compares the net fiscal impact of foreign- and native-born individuals in a given year or multiple years.

● **Net transfer profiles** seek to estimate the net present value of the fiscal impact of foreign- and native-born populations across their entire lives.

● **Generational accounting** estimates the net present value of the net fiscal contribution of foreign- and native-born individuals across not only their own lives, but also the lives of their descendants.

● **Macroeconomic models** generally investigate whether a change in foreign-born inflows would affect future government budgets, not only through taxes paid and services used by the foreign-born and their families, but also through their wider effects on the economy. These wider effects can for example include increases in tax payments of native-born workers whose labour incomes rise as a result of immigration.

The accounting approach's functional components

For the accounting approach on which this chapter's analysis is based, public revenues and expenditures are divided into their functional components.[4] For each of these components, the share contributed by immigrants is estimated based on survey information related to individuals' incomes, expenditures, and usage patterns of public programmes and services. The estimated revenues and expenditures are added up to estimate the net fiscal contribution of the foreign- and native-born populations. By dividing these contributions by the number of foreign- and native-born individuals, the average per-capita net fiscal contribution (hereafter called per-capita net fiscal contribution) is then calculated.[5]

The estimation basis for the share of tax payments and government expenditures attributable to immigrants depends on the type of revenue or expenditure and on the survey on which the estimation is based. Annex 6.A1 provides a more detailed explanation, but for most partner countries, the major categories were estimated as follows:

● The immigrant payment share of income taxes and social security contributions were typically based on labour income as reported in the survey. It corresponded either to the immigrant income share or was estimated by applying simplified tax rules to reported incomes.

● The value added and other indirect taxes payment share usually corresponded to the share of reported expenditures or was estimated by applying tax rates to different categories of goods and services. Most other immigrant tax payment shares were simply set equal to the immigrant share in the population aged 18 and above.

● The immigrant share in many government expenditures was set equal to the immigrant share in the overall population. The reasoning is that, for example, while children and teenagers are unlikely to contribute to the payment of corporate income taxes, they nonetheless cost the government money in terms of the provision of for example infrastructure.

● Health and education expenditures were usually calculated based on estimated usage. Examples are the share of immigrants among individuals that had reported to have visited a public hospital or the share of immigrants and their offspring among students.

● The share of social security transfers of immigrants was typically estimated (i) according to whether they or someone in their household had received transfers or (ii) directly based on the reported amounts received.

The approach's disadvantages and advantages

Compared to other estimation methodologies, the accounting approach suffers from a number of shortcomings. The main disadvantage is that individuals' contributions vary greatly over their lifetimes. Children and retirees typically generate a lot of costs and pay few taxes, while the opposite is true for the average person of working age. When immigrants are overrepresented in the working age category, their fiscal contribution may look positive in a given year, but this may shift over time as these immigrants age. In contrast, when immigrants are particularly concentrated among the elderly, their net fiscal contribution in a given year may be negative, but this estimate neglects to take into account that they may have paid more taxes and contributions in the past. This shortcoming is partially addressed later in the chapter by studying to what extent the fiscal impact of immigrants would shift if they had the same age structure as native-born individuals.

The second major disadvantage is that general equilibrium effects are not taken into account. For example, immigration could boost economic growth, which could increase tax revenues and decrease public expenditures overall. Another effect is that immigrants have children and grandchildren, who themselves can make positive or negative net fiscal contributions.

Several advantages of the methodology counterweigh its disadvantages. Aside from the lower analytical and data requirements, it relies on fewer assumptions. For example, an estimation of the lifetime fiscal contribution of current immigrants would require strong assumptions about future public expenditures and tax structures as well as about how likely immigrants are to remain in the country and how well they will integrate into the labour market. Given the sometimes strong fluctuations in these and other determining components, creating reasonable assumptions about their future development is extremely difficult. This is true for all countries, but perhaps particularly so for developing countries.

While efforts were undertaken to make the estimates as comparable as possible across countries, the actual comparability is still limited. Because the different surveys did not all contain the same information, the basis for allocating different revenues and expenditure shares to foreign- and native-born individuals is not always consistent. Another reason is that the expenditure and tax structure itself determines how much the per-capita net fiscal impacts of foreign- and native-born taxpayers vary. This is because certain taxes and expenditures cannot be directly allocated to individuals based on their characteristics, but rather "belong" either to all inhabitants or to the native-born. In countries where such non-assignable components make up a large share of revenues and expenditures, the difference between the estimated net fiscal contributions of foreign- and native-born individuals under the average cost scenario (see below) is smaller.

Finally, the precision of estimates varies across countries. In some countries, the underlying household survey includes many observations and immigrants make up a large share of the population. In others, both the number of observations and the immigrant share

are limited. The smaller the number of observations, the less precise is the estimate. Given these constraints, the most interesting feature of the cross-country comparison is to see to what extent the difference in the characteristics of foreign- and native-born individuals affected the difference in their fiscal impacts.

The direct fiscal contribution of foreign populations varies but is limited overall

The analyses show not only that the shares of expenditures and income allocated to immigrants but also the overall net fiscal impacts of immigration differ across countries.

In countries where immigrants pay a disproportionally high share of income taxes and social security contributions, they also pay an estimated higher share of indirect taxes on goods and services (Table 6.1). The income tax share of immigrants is estimated to be below the population share in the three Latin American countries and Côte d'Ivoire, while the share of indirect taxes is estimated to be below the population share in Argentina and Côte d'Ivoire.

This pattern suggests that even though immigrants send more transfers to their family members than do native-born individuals,[6] they may also spend more in their host countries. This is the case in Côte d'Ivoire, the Dominican Republic, Ghana and Kyrgyzstan. Thus, they would save proportionally less than native-born individuals at the same income levels.

Evidence from a number of OECD countries suggests that immigrants' savings rates are indeed lower than that of comparable native-born individuals;[7] but this may not apply in other countries. Actually, the immigrant shares of personal income taxes and social security contributions are estimated to be higher than their shares of indirect tax payments in Argentina, Costa Rica, Nepal, Rwanda and South Africa. This indicates that the consumption of immigrants in these countries may be lower than their income levels would suggest.

Regarding social security expenditures, a relatively clear and intuitive pattern emerges. The share of these benefits paid to immigrants tends to be higher than the immigrant population share in countries such as Argentina and Kyrgyzstan where a high proportion of immigrants have been living in the country for a long time and are older. This mirrors the findings for OECD countries (OECD, 2013).

The estimated share of education and public health costs attributable to immigrants varies. Of the nine countries, only in the Dominican Republic, Ghana and South Africa are both their education and health cost shares at or below their share in the population. Nepal is the country where immigrants are estimated to require disproportionally high expenditures in both health and education.

Simply based on the method by which the immigrant share of expenditure was estimated, the cost share estimate for other public goods is either equal to their population share or below it.

- The **average cost scenario** estimate is one where the costs of all public goods are distributed equally among all individuals, regardless of their country of birth. Each individual is assumed to be responsible for the same average cost.

- Under the **marginal cost** scenario, expenditures on categories of public goods that are not thought to depend on population size are allocated solely to native-born individuals. Such public goods (e.g. defence) would therefore presumably be equally high even if all immigrants left the country. This scenario only allocates to immigrants those expenditures that are in addition to (marginal) compared to those that would have been undertaken in any case.

Table 6.1. **Immigrants contribute to different taxes and expenditures in varying shares**

Public revenues	Immigrants (% population)	Immigrants (% adult population)	Immigrants (% working population)	Income	Social security	Corporate income	Capital transactions	Property	Goods and services	Imports and exports	Other
Argentina	4.3	5.6	5.2	3.4	4.0	5.6	5.4		2.5		4.3
Costa Rica	8.9	11.1	12.1	7.5	6.7	11.1		5.3	6.8		11.1
Côte d'Ivoire	7.1	11.6	13.2	5.6	3.7	11.6		11.8	7.6	7.6	0
Dominican Republic	2.8	3.7	4.0	0.6	4.4	3.7	2.5	2.5	3.8		3.7
Ghana	1.0	1.1	1.1	1.2	1.0	1.1			1.3	1.1	0.0
Kyrgyzstan	4.4*		3.8	4.5	4.5	3.1			4.8		3.7
Nepal	4.2	6.1	5.0	6.1		6.1		6.1	4.1	6.1	6.1
Rwanda	3.6	5.4	4.2	19.2		5.2	5.1		6.8	3.9	1.6
South Africa	4.2	5.8	8.8	11.7	5.8	5.8	5.8		6.4	5.8	5.8

Public expenditures	Immigrants (% population)	Immigrant (% adult population)	Immigrants (% working population)	Public goods	Social security	Education	Health
Argentina	4.3	5.5	5.2	2.7/4.3	5.9	5.1	4.2
Costa Rica	8.9	11.1	12.1	2.4/8.9	2.9	11.9	8.0
Côte d'Ivoire	7.1	11.4	9.9	1.0/7.1	21.2	6.6	7.2
Dominican Republic	2.8	3.7	4.0	1.8/2.8	0.4	1.8	2.7
Ghana	1.0	1.1	1.1	0.07/1.0	1.0	1.0	0.8
Kyrgyzstan	4.4*		3.8	1.4/4.4	11.3	3.5	6.5
Nepal	4.2	6.1	5.0	2.3/4.2	3.5	5.3	5.6
Rwanda	3.6	5.4	4.2	0.3/3.6		10.9	3.1
South Africa	4.2	5.8	8.8	1.7/4.2	4.2	2.6	4.2

Lower revenues and higher expenditures compared to overall population share

Equal revenues and expenditures compared to overall population share

Higher revenues and lower expenditures compared to overall population share

Not applicable

Note: * Information on the place of birth is available only for individuals over 18-years-old in the *Life in Kyrgyzstan* survey.
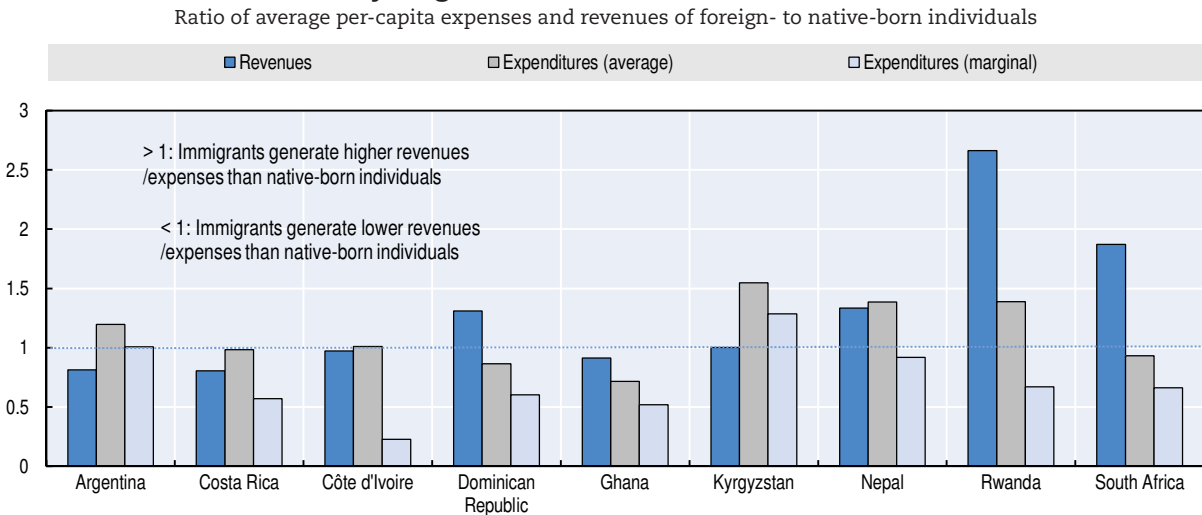
Source: Authors' own work based on government budget data and household surveys (see the chapter's appendix).

Depending on the size of expenditures on these types of goods, the gap between the upper and lower range estimates is larger or smaller.

In some countries, the ratio of per-capita public revenues and expenditures of immigrants compared to native-born citizens is close to one, while in others, one or both of them is substantially larger than one (Figure 6.7). A ratio of one indicates that an immigrant pays on average as much in revenues or costs in expenditures as a native-born individual. In most countries, the ratio is not lower than 0.8 (Argentina and Costa Rica) nor higher than 1.9 (South Africa). In Argentina and Costa Rica the per-capita public revenues generated by immigrants were around 20% lower than those of the average native-born person and in South Africa 87% higher.

The situation in Rwanda is drastically different. The average expenditure ratio is 1.4, indicating that immigrants "cost" more than Rwandans, as long as the costs for pure public goods are also borne by them. Nevertheless, this is by far offset by the tax payments of immigrants: the average revenue ratio is 2.7, meaning that immigrants on average pay almost three times the taxes and contributions that native-born taxpayers do. It is clear that the higher concentration of immigrant workers in non-vulnerable employment and in high-productivity sectors boosts their contributions to public finances, particularly through income tax payments.

Figure 6.7. **There are no clear patterns that fiscal revenues and expenditures of foreign-born individuals are always higher or lower than those of native-born individuals**
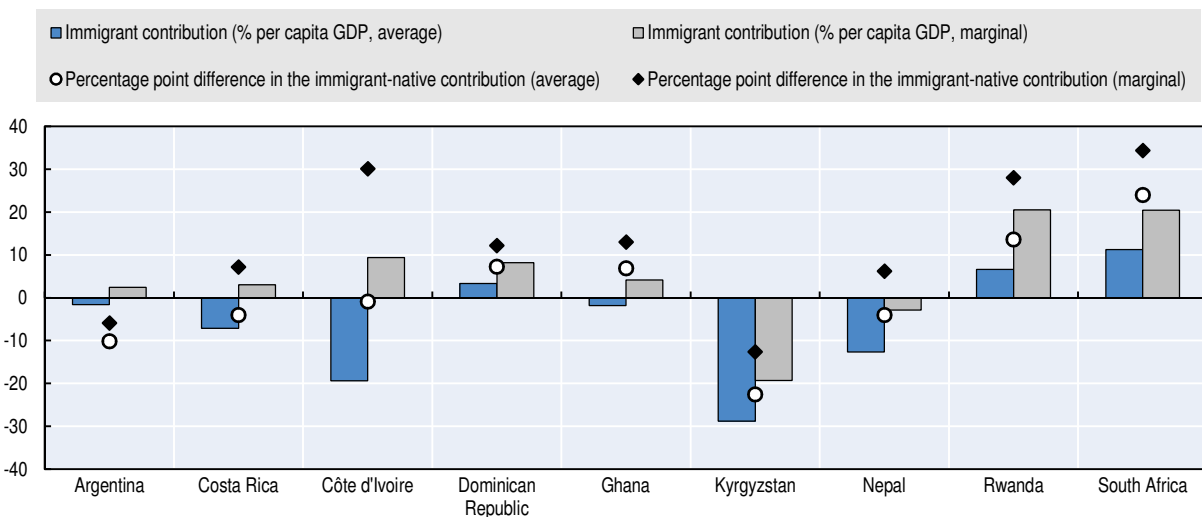
Ratio of average per-capita expenses and revenues of foreign- to native-born individuals

Source: Authors' own work based on government budget data and household surveys (see the chapter's appendix).

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In some partner countries, the per-capita net fiscal contribution of immigrants is relatively large (Figure 6.8). Under the average cost scenario in which the costs of all public goods are allocated to the entire population, the per-capita net fiscal contribution of immigrants is lower than -10% of per capita GDP in four countries (Côte d'Ivoire, Ghana, Kyrgyzstan and Nepal) and higher than 10% of per capita GDP in one country (South Africa). However, under the marginal cost scenario, the average per-capita net contribution is below -10% in only one country (Kyrgyzstan) and exceeds 10% in two countries (Rwanda and South Africa).

Figure 6.8. **The per-capita fiscal impact of immigrants may be quite high in developing countries**

Source: Authors' own work based on government budget data and household surveys (see the chapter's appendix).

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The overall average net fiscal contribution in a country (that is, of both foreign- and native-born individuals together) depends on whether the country currently has a public surplus or deficit. The difference between the per-capita net fiscal contributions of the foreign- and of the native-born is more useful for this report. The marginal-cost scenario estimates that the per-capita net fiscal contribution of immigrants is negative and significantly lower than that of the native-born population in Argentina and Kyrgyzstan; the average-cost scenario adds Costa Rica and Nepal (Figure 6.8). Even under the average-cost scenario, the per-capita net fiscal contribution of immigrants is at least five percentage points higher than that of the native-born in Rwanda and South Africa.

The seemingly large negative impacts in certain countries (notably Côte d'Ivoire, Ghana, Kyrgyzstan and Nepal) may raise fears that immigration imposes a substantial fiscal burden they can ill afford to bear, but several caveats apply:

1. In two of the four countries – Côte d'Ivoire and Nepal – the per-capita net fiscal contribution of immigrants is much less negative or even positive once expenditures on certain public goods, such as defence, are allocated only to the native-born. In this situation, spreading the costs of these public goods on more shoulders may actually be beneficial.

2. The precision of the overall estimates is necessarily limited because they are not based on actual tax records.

3. Per-capita net fiscal contributions can vary greatly over time.

4. When the focus shifts to the overall rather than the per-capita net fiscal contribution, it becomes clear that in all partner countries, the impact is quite limited (Figure 6.9). Under the marginal-cost scenario, the overall net fiscal impact of immigration is less than -1% of GDP in the two countries in which it is negative (Kyrgyzstan and Nepal). It is positive, but below 1% of GDP, in the other seven countries. Even under the average-cost scenario, the lowest impact is above -1.5%.

Figure 6.9. **The overall net fiscal contribution of immigrants is limited in the partner countries**
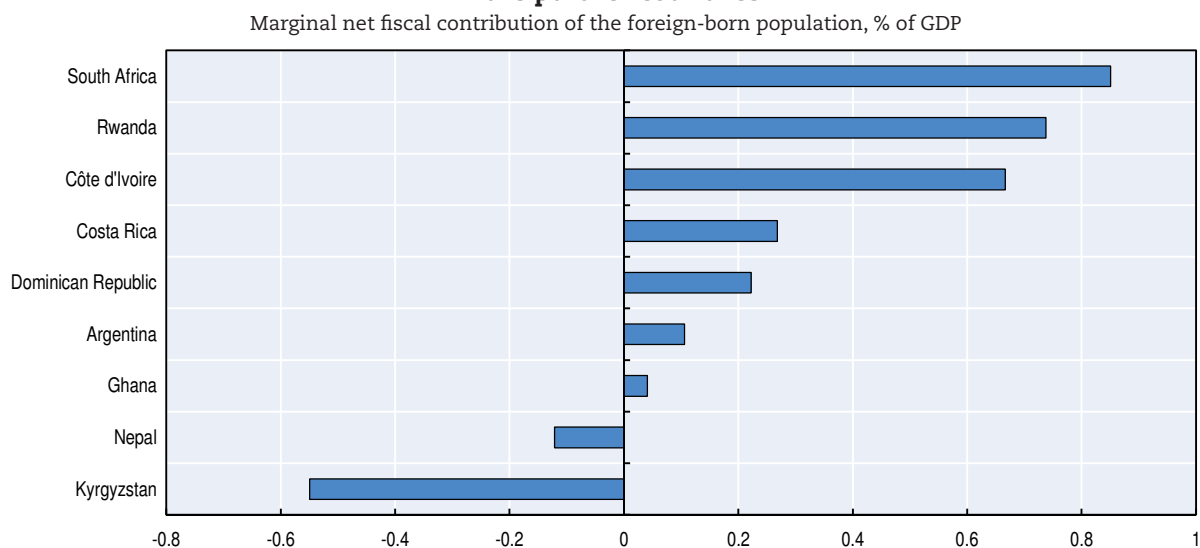
Marginal net fiscal contribution of the foreign-born population, % of GDP

Source: Authors' own work based on government budget data and household surveys (see the chapter's appendix).

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A negative contribution in one year does not mean that the overall fiscal contribution of immigrants is negative. In ageing economies such as Kyrgyzstan, immigrants who

seem to generate higher public expenditures than revenues have often contributed to the economy for several decades. Over their lifetimes, they may thus have made positive net fiscal contributions, even though in one particular year, the contribution is negative. The following section explores this in more detail.

Factors shaping the foreign-native-born difference in the fiscal contribution

As seen above, there are large ranges in the net fiscal contribution of immigrants and in the difference between it and the contribution of native-born individuals across partner countries. Differences in the composition of the immigrant population and in the tax and expenditure structure clearly contribute to this range of outcomes. In contrast, immigrants in most partner countries are less likely to benefit from social security mechanisms than native-born individuals.

Immigrants in the partner countries depend less on the social security system

The level of development of the social security systems in the partner countries varies strongly. Argentina devotes 42% of public expenditures to social security, while Côte d'Ivoire and Ghana allocate 1% or less. The rights for immigrants to access the social security system naturally also differ from country to country (see Table 2.1). At the time of the analysis, Ghana, the Dominican Republic[8] and Nepal restricted their pension schemes to citizens. In other countries, regular immigrants could participate in the social security system. Minimum contribution periods apply before they are eligible for payments.

Irregular immigrants cannot participate in the social security system of any of the partner countries. In countries where irregular immigration is prevalent, immigrants are therefore less likely to receive benefits. In addition, workers in the informal sector, be they foreign- or native-born, are excluded from the contributory components of the system in most partner countries. Given that immigrants are often over-represented in irregular employment, this further reduces their inclusion in the social security system.

When comparing the shares of foreign- and native-born individuals that receive social security benefits and their amounts, the foreign-born proportionally receive benefits more frequently and in higher amounts in some partner countries and proportionally less in others (Table 6.2). For example, the share of immigrants that reported receiving pension payments in Argentina in a 2013 household survey was seven percentage points higher than the equivalent share of native-born individuals; in Kyrgyzstan, the discrepancy was even three times higher. In contrast, the share of immigrants in Costa Rica that received social transfers other than pension payments was eleven percentage points lower than the equivalent share among native-born individuals. In Côte d'Ivoire, Ghana, Nepal and Rwanda, there was almost no difference in the share of the native- and foreign-born populations receiving a pension, but some of the average benefits received by immigrants were lower than those of native-born beneficiaries.

The different characteristics of foreign- and native-born individuals explain these patterns of receiving benefits. The results either showed no significant differences in the likelihood that foreign- and native-born individuals with similar characteristics (such as age and education) receive benefits or that immigrants were less likely to receive them. This is the case in Costa Rica, Nepal and Rwanda. However, immigrants in Argentina are one percentage point more likely to receive non-pension benefits than native-born individuals that are similar in terms of demographic characteristics and education. When immigrants do receive transfer payments, the amounts tend to be equal to or lower than those of similar

native-born individual. The exception is pension benefits in Kyrgyzstan, which are on average slightly higher for immigrants than for similar native-born individuals. However, in Côte d'Ivoire and Ghana, sample sizes were insufficient to come to a definite conclusion.

Table 6.2. **Immigrants in most partner countries are less likely to receive social security benefits**

Difference in unadjusted means and characteristic-adjusted regression results

	Unadjusted				Adjusted			
	Benefit receipt (p.p.)		Benefit amount (%)		Benefit receipt (p.p.)		Benefit amount (%)	
	Pension	Social benefits	Pension	Social benefits	Pension	Social benefits	Pension	Social benefits
Argentina	7	-3	-1	-16	-4***	1**	-8***	-3
Costa Rica	-7	-11	15	-31	-9***	-6***	-4***	-31***
Côte d'Ivoire	0		-20		0		23	
Ghana	0	0	-80	-58	0	0	-65	-12
Kyrgyzstan	21	1	23	-23	-2	1	6*	-30
Nepal	-2	-1	3	-47	-4*	-1	-14	-6
Rwanda	0	-4	-2	-50	-1**	-2***	-3***	-73

Note: The difference in benefit receipt is given in percentage point (p.p.). For the adjusted regression results, the additional control variables include age, age squared, an indicator variable for being 65 years or older, sex, education level and being married or living with a partner. Significance levels are indicated by * (.1), ** (.05), *** (.01). The Dominican Republic is excluded because the social security system was privatised in 2001. For Nepal, the benefit receipts and amounts are for the household rather than the individual.

Source: Authors' own work based on government budget data and household surveys (see the chapter's appendix).

One important factor that can influence whether or not immigrants receive social security benefits is how long they have been in the country. Unfortunately, most of the data sources used do not contain immigrants' years of arrival. For Côte d'Ivoire and Rwanda, years since immigration were inferred by the number of years immigrants had lived in their community since arriving from abroad. However, information was missing for 80% of immigrants in Côte d'Ivoire and 30% in Rwanda, because they moved within the country at least once after their arrival. For Côte d'Ivoire, including the proxy variable and an indicator variable showing when the information was missing for immigrants does not alter the results in a fundamental manner. For Rwanda, immigrants who had just arrived or for whom the information was missing are about two percentage points less likely to receive social benefits, but not pensions. For the benefit and pension amounts for Rwanda, the point estimates change but remain statistically insignificant.

Different characteristics of native- and foreign-born individuals can explain differences in their fiscal contributions

As seen in Chapters 2 and 3, the native- and foreign-born populations have different demographic and labour market characteristics from each other in most of the partner countries. For example, a smaller proportion of immigrants tend to be children, while a higher proportion of them are working-age adults (Figure 2.6). Concerning educational distribution, immigrant workers in four countries are both over-represented among the low and highly educated and underrepresented among intermediate educational levels (Figure 3.18). In two countries, the over-representation is solely concentrated at higher educational levels, while in three countries it occurs at lower and intermediate levels. In all but two countries, the difference in the employment-to-population rates exceeds nine percentage points.
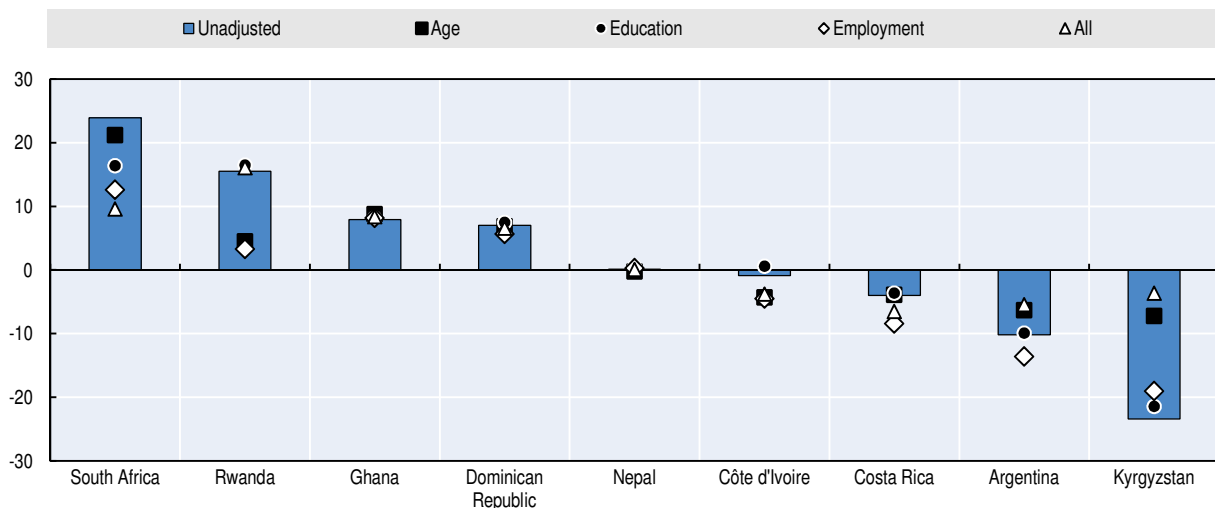
Naturally, these different characteristics also affect the populations' net fiscal contribution. Further analyses determined how much of the difference in the per-capita net fiscal contribution of immigrants can be attributed to their different characteristics compared to the native-born.

If the age structure of the immigrant population were more similar to that of the native-born population, the difference between the per-capita net fiscal contributions of the two populations would be less pronounced in several partner countries than it currently is (Figure 6.10). One likely reason is that in many countries where the net fiscal contribution of immigrants is lower than the one of the native-born, such as Argentina and Kyrgyzstan, a higher share of immigrants than of native-born individuals is elderly. This has two causes. On the one hand, public expenditures – in the form of pension payments and medical expenditure – typically rise as individuals age. On the other hand, public revenues are probably lower because retirement-age individuals typically earn and consume less, affecting receipts from personal income taxes and indirect taxes. In contrast, in countries where the net fiscal contribution of immigrants is higher than that of native-born individuals, such as in Rwanda, a larger share of immigrants is of working age. This is consistent with findings for OECD countries (OECD, 2013).

If the employment rates of foreign- and native-born individuals were more equal, the per-capita net fiscal contribution of immigrants compared to the native-born would typically be less favourable. The exceptions are Ghana, Kyrgyzstan and Nepal, where hardly any shift would occur. The change would be particularly pronounced in Rwanda and South Africa.

Figure 6.10. **Personal characteristics account for part of the difference in the net fiscal contribution of foreign- and native-born individuals in several countries**

Unadjusted and assuming that immigrants had the same characteristics as the native-born

Note: These results are based on a pooled Blinder-Oaxaca decomposition. This methodology divides the difference in the per-capita net fiscal contribution in the part that can be explained by different characteristics and the part that cannot be. This is achieved by first running a pooled regression with net fiscal contribution as the dependent and place of birth as well as the relevant adjustment variable(s) as the explanatory variables. Then, the predicted difference in the net fiscal contribution between foreign- and native-born individuals is calculated by applying the estimated regression coefficients to the adjustment variable set at its mean among the native-born population. For the decomposition based on all characteristics, the sex and marital status (partnered or not) were equally included.
Source: Authors' own work based on government budget data and household surveys (see the chapter's appendix).

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Shifts in the educational distribution would often have surprisingly small effects. The exception is South Africa, where the net fiscal contribution of immigrants would be less favourable if they had a similar education profile. This is despite the fact that the per-capita net fiscal contribution tends to rise with education level. For university graduates, the per-capita net fiscal contribution would be positive regardless of their place of birth in

all countries except Kyrgyzstan, where the per-capita net fiscal contribution of immigrants is negative.

Conclusions and policy implications

This chapter shows that the estimated net direct fiscal impact of immigrants in the countries studied was sometimes positive, sometimes negative and small overall. In the countries where the difference between the per-capita net fiscal impacts of foreign- and native-born individuals was largest, the difference would typically be less pronounced if their average ages were equal. With a few exceptions, an equalisation of the employment-to-population ratio would have the same result.

Because analysing the fiscal impact of immigrants is highly complex, determining policy interventions that could increase their fiscal contribution is also difficult. That said, a number of policy changes would likely have a positive impact in most countries.

Create a conducive environment for higher-skilled immigration

● The estimated average per-capita net fiscal contribution tends to rise with education level. Once employed, individuals with high school or university degrees often earn a multiple of what individuals with lower education levels make. This education-earnings premium is large enough to outweigh the increased risk of unemployment that highly educated people face in many low- and middle-income countries.

● That does not mean that a more selective immigration policy seeking to attract immigrants with higher education levels will necessarily raise immigrants' net fiscal contribution. In some of the countries where immigrants are on average less educated than the native-born population, it is unclear whether such an immigration policy would actually attract a significant number of high-skilled immigrants. Besides, given the high unemployment rates for university graduates in some countries, these immigrants may also end up unemployed or in positions for which they are overqualified and in which their wages are lower. Hence their overall net fiscal contribution would be smaller.

● While selective immigration policies are likely not appropriate, policy changes that create an accommodating environment for high-skilled immigrants could be beneficial. For example, in some partner countries, high-skilled immigrants are effectively the only ones that are subject to work permit requirements since only the formal sector requires permits. Simplifying visa and work permit applications and skill recognition processes for immigrants and their prospective employers alike could make the country a more attractive option for the highly-skilled. Given prevailing skill shortages, high-skilled immigrants might complement the skills of the native-born workforce, while potential negative labour market impacts from such a policy change could be limited. For example in Argentina, high-skilled immigration appears to be related to higher labour incomes for native-born high-skilled workers (OECD/ILO, forthcoming).

Promote the labour market integration of immigrants

● Policy interventions that aim to increase the quality of the labour market integration of immigrants are also likely to lead to increased net fiscal contributions. As was seen in Chapter 3, in many of the partner countries, immigrants often have high employment rates, but the quality of their employment may not be high. For example, they are often more concentrated in the informal sector or have vulnerable forms of employment (being

an own-account or contributing family worker). This situation can improve by itself as immigrants integrate into the society and the economy over time, and as the economy grows and offers more and better opportunities to all. In addition, both immigration and non-immigration policy interventions can speed up the process of integrating immigrants.

- In terms of immigration-specific policies, guaranteeing that immigrants have a regular status is the first step to ensure that formal employment opportunities are open to them, in addition to helping protect the immigrants' rights. Given that immigration tends to be intra-regional in the majority of partner countries, regional mobility agreements (such as those that exist for countries in the Economic Community of West African States) can be a way of achieving this, provided that they are implemented. Facilitating the administrative procedures for recruiting and hiring foreign-born individuals, and for recognising foreign degrees and certificates, could further help immigrants obtain higher-quality jobs.

- Other interventions that are open to firms and individuals regardless of their origins could also improve the net fiscal contribution of immigrants as well as of the native-born. These measures may include setting regulations for the formal sector – such as regarding labour rights and taxation - at appropriate levels and extending them to the informal sector (ILO/WTO, 2009). This could help grow the formal sector as the costs for firms to stay formal relative to being informal decrease. Providing training and education opportunities to workers throughout their lifetimes could also help improve the quality of employment (OECD, 2009), and hence the net fiscal contribution of workers.

The return of immigrants to their home countries should not be promoted for the sake of fiscal benefits

- The limited evidence in this chapter suggests that promoting the return of individuals of retirement age to their countries of origin would probably not have positive effects on the fiscal balance of the partner countries. The estimated net fiscal contribution, excluding the social security system, of retirement-age immigrants was positive in six of the seven countries for which the analysis was carried out.[9] If immigrants continue to have rights to their pensions when they leave the host country, host countries would be fiscally worse off because they are estimated to pay less for congestible public goods, education and health services for immigrants than the immigrants contribute through their tax payments. The cost of pure public goods is disregarded because it would continue to be borne by the remaining population.

- Pension portability between countries should be promoted to improve the well-being of immigrants, rather than with the expectation to improve public finances.

Deepen the analysis of the fiscal impact of immigration

- The estimates presented in this chapter are a starting point for understanding the fiscal contribution of immigrants, and there is still much more to learn. First, to understand how their fiscal contributions evolve over time, and in particular through different phases of the business cycle, analysis needs to be carried out for multiple years. Second, the estimates, in particular of direct tax payment shares, could be more accurate if anonymised tax records linked to information about countries of birth could be analysed. Third, for certain countries it may be feasible and worthwhile to study not only the current but also the lifetime net fiscal contributions of immigrants.

Notes

1. The analysis requires survey or census data that at a minimum contains information on individuals' countries of birth and labour incomes. These data are not available for Thailand.

2. To ensure international comparability, most data presented in this part of the chapter are taken from the *World Bank DataBank* (World Bank, undated), which in turn is based on the IMF *Government Finance Statistics Yearbook* and World Bank and OECD GDP estimates. At times, however, there are discrepancies with the national-level data showing disaggregated public revenues and expenditures on which the fiscal impact analysis is based.

3. The model estimates the size of the informal economy based on tax and regulatory burden, business and economic freedom, and the unemployment and self-employment rates.

4. Ghana is an exception: expenditure was classified according to the economic rather than the functional components.

5. For Kyrgyzstan, the per-capita contributions and expenditures were estimated only for the population aged 18 and above.

6. For an example, see Kamasaki and Arce (2000) on Hispanic immigrants in the United States.

7. See for example Carroll, Rhee and Rhee (1994) on Canada, Bauer and Sinning (2011) on Germany and Amuedo-Dorantes and Pozo (2002) on the United States.

8. This changed in November 2015 through Resolution 377-15.

9. The analysis was not carried out for Nepal and Rwanda as the social security contribution share of immigrants was not estimated for these countries. The net contribution of immigrants 65 years old and older excluding the social security system was negative in Ghana.

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ANNEX 6.A1

Data and methodology

The analysis presented in this chapter follows an adjusted version of Dustmann and Frattini's (2014) analysis of the fiscal impact of immigration in the United Kingdom. The analysis is based on two main sources: government budget data and household surveys.

The budget data sources were provided by the Directorate General of Budget of the Dominican Republic (DIGEPRES, 2007), the Ministry of the Economy and Finance of Côte d'Ivoire (2010), the Ministry of Finance of the Government of Ghana (2014), the Ministry of Finance of the Kyrgyz Republic (2014), the Ministry of Finance of the Government of Nepal (2013), the Ministry of Finance and Economic Planning of the Republic of Rwanda (2013), the Ministry of the Treasury of Costa Rica (2013), the National Institute for Statistics and Censuses of the Republic of Argentina (INDEC, 2015) and the National Treasury of the Republic of South Africa (2011).

The household surveys were the 2013 *Annual Urban Household Survey* and the *National Household Income and Expenditure Survey* for Argentina (INDEC, 2011 and 2013); the 2013 *National Income and Expenditure Survey* for Costa Rica (INEC, 2013); the 2008 *Household Living Standard Survey* for Côte d'Ivoire (INS, 2008); the 2007-08 *National Household Income and Expenditure Survey* for the Dominican Republic (ONE, 2009); the 2013 *Ghana Living Standards Survey* (GSS, 2013); the 2010-13 *Life in Kyrgyzstan* survey (DIW Berlin/SIPRI, 2010-13); the 2011 *Nepal Living Standards Survey* (CBS, 2011); the 2014 *Integrated Household Living Conditions Survey for Rwanda* (NIS, 2014); and the 2011 *Population Census*, the 2010/11 *Income and Expenditure Survey* and the *National Income Dynamics Survey* for South Africa (Statistics South Africa, 2011a, b and c).

Each of the expenditure or revenue components is estimated based on the information that is given in the survey. The estimation usually relies on either the distribution of labour income, expenditures, personal characteristics (including enrolment in educational institutions), benefit usage or simple population shares.

Income-based estimates

The estimation of personal income taxes and social security contributions are typically based on labour income. The exceptions are the Dominican Republic and Nepal, where survey respondents directly reported tax payments (see "expenditure based estimates"). In some cases (Argentina, Costa Rica, Ghana, Rwanda and South Africa),[1] the individual tax payments are estimated by applying the relevant average tax rates and major deductions to the reported labour income. The estimated tax payments of foreign- and native-born workers are then added up in order to estimate their tax payment share.

In other cases (Côte d'Ivoire and Kyrgyzstan), the survey also contains information that provides an indication of whether individuals work in the formal or informal sector and hence whether they are likely to pay income taxes and in particular social security contributions. Where this information is available, the estimated taxes or contribution payments of informal workers are disregarded in the calculation of the overall tax share.[2]

The distribution of property and capital taxes in Côte d'Ivoire is also estimated based on a specific income category. They are based on the share of reported dividends, interest and other revenues obtained by immigrants according to the household survey.

For Rwanda, the distribution of corporate income taxes and import taxes are based on information on income derived from business activities. To estimate the share of income taxes immigrants pay, the shares of business income paid by foreign- and native-born individuals according to the survey are used. To estimate the share of import taxes immigrants pay, the share of immigrants that receive any business income is used.

In some countries, the estimates of social security expenditures are based on reported pension and other social security transfer income. These countries are Argentina, Costa Rica, Côte d'Ivoire and Kyrgyzstan. For Nepal, the reported social security benefits at the household level are distributed among the adult household members. For other countries, such information is not available. However, for the Dominican Republic and Rwanda, information is available on whether a household member benefited from such transfer payments. The share attributed to immigrants is equal to the share of immigrant heads of households receiving the benefits.

Expenditure-based estimates

Whenever possible, the estimation of indirect taxes such as value added and excise taxes are based on reported expenditures. In some cases (Côte d'Ivoire, Ghana, Kyrgyzstan, Nepal and Rwanda), it is simply based on the overall share of expenditures of foreign- and native-born individuals or households. When expenditures are reported at the household level, they are simply divided among all adult household members.

In other cases (Costa Rica and the Dominican Republic), the structuring of different indirect tax rates across categories or goods and services is taken into account. Where this is the case, the expenditure on each category is multiplied by the relevant tax rate and added up to obtain the total estimated indirect tax payments. The shares of these payments are then taken to estimate the amounts paid by foreign- and native-born individuals.

Finally, for Argentina and South Africa, two surveys are used to estimate the indirect tax payments of foreign- and native-born individuals. The survey that contains information on expenditures contains no information on the country of birth. Therefore, the estimated indirect tax payments for households with a given set of characteristics are estimated based on the second survey and then applied to the first in order to estimate the indirect tax payments of foreign- and native-born individuals.

In the Dominican Republic and Nepal, some direct taxes are equally estimated based on reported values in the household survey. For the Dominican Republic, the income tax payment share is estimated based on reported income tax payments in the income and expenditure household survey. For Nepal, the survey reports the household tax expenditure on income, land, housing and property taxes. It is therefore used as the estimation basis for all direct tax payments.

Usage-based estimates

Education expenditure estimates were typically based on inferred or actual usage. Information on whether someone attended school was taken from the relevant household survey. In some cases, the precise level of schooling was available, while in other cases it was inferred from the age of the person. In the majority of countries (Argentina, Costa Rica, Ghana, Nepal, Rwanda and South Africa) people attending private educational institutions were excluded from the calculation. Minors living in a household where the household head and the spouse were born abroad were counted among immigrants for the purposes of this calculation. If the household head was born abroad but the spouse was not, or vice versa, the number of children was split between the two. The share of immigrants and their children attending a given school level was then multiplied by the total cost of that level of education. In some cases, the disaggregation across educational levels was directly obtained from national sources, but in most cases the distribution was taken from a UNESCO database (undated).

For health expenditures, in many cases the estimation is based on reported usage of medical services in the previous month(s). The period differs from country to country depending on the household surveys. In many countries (Costa Rica, Côte d'Ivoire, the Dominican Republic and Nepal), care was taken to exclude medical visits to non-public medical practitioners. For Ghana, the immigrant share is equal to the share of immigrants among the beneficiaries of health care payments through the National Health Insurance Scheme. In Nepal, the usage share for health expenditures was also used to estimate the benefit share for other social security expenditures.

In Argentina, household surveys that contain information about the country of birth do not contain information about health care utilisation. Therefore, age-dependent public health utilisation rates were multiplied by the age structure of the foreign- and native-born populations in order to estimate their average health care expenditures.

The exception to the usage-based approach is South Africa. There the same expenditure amount for all individuals was assumed.

For Ghana, a functional split-up in public expenditures is not available. The distribution of expenditures on public employees is based on the shares that are native- and foreign-born.

Characteristics-based estimates

In some cases, taxes or other expenditures are based on personal or household characteristics. For example, in Costa Rica, property tax payment shares are estimated on the relative value of rent perceived by the household or the imputed rent their property would be worth if they did not live there.

Population share-based estimates

Finally, some revenues and a relatively large share of expenditures are based simply on the population share.

The revenue components that are most frequently estimated based on population shares are "other taxes" (in Argentina, Costa Rica, Côte d'Ivoire, Kyrgyzstan, Nepal and Rwanda), corporate income taxes (in Argentina, Costa Rica and Côte d'Ivoire) and property taxes (in Kyrgyzstan). The "other taxes" were often composed of a multitude of different taxes that made up a small share of the total tax revenue; and the estimation basis would frequently have been complex. In addition, in some countries (for example Rwanda) it also includes

non-tax revenues. For South Africa, social security benefits and health expenditures were also equally distributed among foreign- and native-born individuals.

For corporate income taxes, the justification for basing the estimation on the adult population share differed. The reason is that it is difficult to know what share of corporate income tax is "paid" by owners, shareholders or workers (Auerbach, 2006; Arulampalam, Devereux and Maffini, 2012). Given this uncertainty, it is more prudent to allocate it to all members of the society. Exceptions to this allocation are made in Kyrgyzstan, where general corporate income taxes are distributed to shareholders (estimated by the share of dividends received) and the tax on the profits of the Kumtor Gold Company are allocated based on the shares of foreign and Kyrgyz workers.

Expenditures on public goods, both pure and congestible, and expenditures of the legal system are in all cases allocated based on the population share. Pure public goods are goods to which additional users can be added and whose usage is non-rival, meaning that one person's usage does not diminish its availability to another person. There is no rational basis to allocate their costs more to one individual than another. All inhabitants for example benefit from the national defence in an equal manner. The distribution of the costs of these goods to immigrants is subjective. Some people might argue that the expenditures on these goods would be as high even if there were no immigrants in the country. Under this scenario – the so-called marginal-cost scenario – the expenditures are divided among native-born individuals only. However, other people may point out that the immigrants also benefit from these goods so they should also be responsible for the expenditures. Under this scenario – the average-cost scenario – the costs are split among foreign- and native-born individuals according to the relative size of their populations.

Congestible public goods are goods for which the usage by one person can, above a certain threshold, affect the quality of that good for another user. Some may argue that certain population groups benefit from them more than others and should thus be attributed a higher share of the costs. For example, a car owner generally creates more wear and tear on roads than someone who does not own a car. The practical argument against this is that there is usually insufficient information to know an individual's actual degree of usage of a congestible public good. In addition, it could be argued that if individuals could theoretically access congestible public goods, they should contribute to the costs, even if they do not actually make use of the goods. Therefore, this study splits the costs of congestible public goods among foreign- and native-born individuals according to the population share.

Notes

1. For South Africa, the census only indicates an individual's income range. For the calculation, the mid-point of each income category and the lower bound for the upper-income category were assigned.

2. For Rwanda, for social security contributions only the income of workers that reported a monthly income were taken into account as these are assumed to be formal sector workers.

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