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The economic effects of labour immigration in developing countries: A literature review

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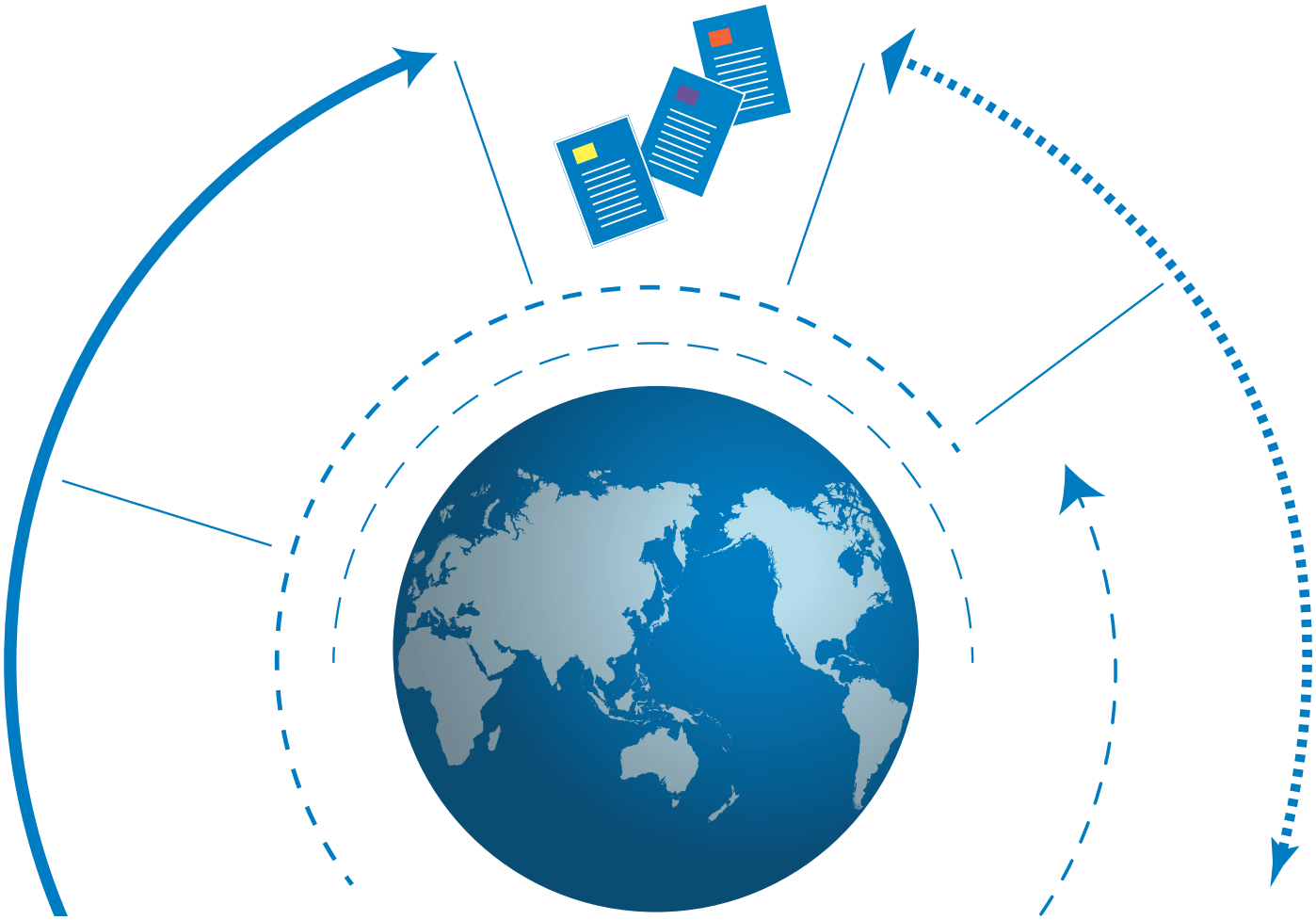

OECD DEVELOPMENT CENTRE

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TABLE OF CONTENTS

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The opinions expressed and arguments employed in this document are the sole responsibility of the authors and do not necessarily reflect those of the OECD, of the project or of the governments of its member countries. All errors belong to the authors.

PREFACE

Labour migration is a key driver of development both for developed and developing countries. The incorporation of migration into the 2030 Agenda for Sustainable Development and in the Sustainable Development Goals acknowledges this reality. However, the actual economic effects of labour migration on the development of a country are often poorly understood, particularly for developing countries, due to the lack of data. This lack of understanding has important consequences since labour migration is a sizeable and increasing phenomenon for developing countries too: about 40% of the 243 million people who were living outside their country of birth in 2015 were living in low- or middle-income countries.

The OECD Development Centre's work on migration and development aims to fill the data and knowledge gaps, and identify the costs and benefits of migration for the migrants themselves, for the countries of origin and for the developing countries of destination. Migration is at the centre of our priorities, and we have been working to build a global dialogue on migration and development through a series of initiatives, including: "Interrelations between public policies, migration and development of partner countries," the "Global Knowledge Partnership on Migration and Development," and the 2017 edition of the Development Centre's *Perspectives on Global Development*.

As a part of such initiatives, the Development Centre and the International Labour Organization (ILO) have launched a project on "Assessing the economic contribution of labour migration in developing countries as countries of destination", co-financed by the European Union. The project addresses the economic contributions of labour immigration in developing countries, a topic that has received little attention compared to the effects of immigration in developed countries.

Since August of 2014, this joint project developed a methodology to measure the economic contributions of migration and identified data sources and gaps. Through national consultation seminars held from April to December 2015, the project successfully launched in ten partner countries: Argentina, Costa Rica, Côte d'Ivoire, Dominican Republic, Ghana, Kyrgyzstan, Nepal, Rwanda, South Africa and Thailand. The project is carrying out an in-depth assessment of the economic effects of labour immigration and will publish the results in forthcoming detailed reports.

This review, a background report for the OECD Development Centre-ILO-EU project, is a first step to explore the impact of immigration on different segments of the economy: labour markets, production sectors, fiscal balances and economic growth. Together with the country-

level analysis, it aims to better inform policy makers and help them design and implement evidence-based immigration and integration policies.

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RÉSUMÉ

Cet article analyse les preuves théoriques et empiriques existantes sur les effets économiques de l'immigration dans les pays en développement. Plus précisément, il explique comment, dans un pays d'accueil, l'immigration peut avoir un impact sur le marché du travail, l'esprit d'entreprise, le capital humain, la productivité, la croissance économique, les taux de change, le commerce, les prix, les finances publiques et les biens publics. Comme la majorité de la littérature pertinente a toujours été axée sur l'expérience des pays à revenu élevé ; cette fois-ci, l'examen met en avant le contexte privilégié des pays en développement et détaille de quelle manière les résultats peuvent être semblables ou différents dans les pays à revenu faible et intermédiaire. En conclusion, les effets économiques de l'immigration sur les pays en développement, un phénomène important si l'on en croit les chiffres, nécessiterait d'effectuer des recherches théoriques et empiriques supplémentaires.

Classification JEL: J61, O1.

Mots-clés: Immigration, Développement

ABSTRACT

This paper reviews existing theoretical and empirical evidence on the economic effects of immigration in developing countries. Specifically, it discusses how immigration may affect labour market, entrepreneurship, human capital, productivity, economic growth, the exchange rate, trade, prices, public finance and public goods in host countries. As the majority of the relevant literature has traditionally focused on the experience of high-income countries, the review highlights the unique context of developing countries and elaborates how outcomes may be similar or differ in low and middle-income countries. A general conclusion is that the economic effects of immigration to developing countries, a numerically important phenomenon, warrants additional theoretical and empirical research.

JEL Classification: J61, O1.

Keywords: Immigration, Development

I. INTRODUCTION

Discussions on the impacts of labour migration for developing countries usually focus on topics related to emigration, such as remittances and brain drain, while immigration related topics are often neglected. The importance of emigration can obviously not be neglected, as nearly 80% of global migrants are from low and middle-income countries (OECD, 2016). But with around one third of global migrants living in developing countries (World Bank, 2010) and some developing countries such as Costa Rica and Côte d'Ivoire having immigrant shares similar to the OECD average (10.7%), immigration to developing countries is likewise an important topic.

Research on the economic effects of immigration abounds, but usually focuses on high-income rather than low and middle-income economies. In view of the scarcity of prior research and the potential importance on the economic effects of immigration in developing countries, the OECD Development Centre and the International Labour Organisation (ILO) launched a project on "Assessing the economic contribution of labour migration in developing countries as countries of destination" in August 2014. The project, co-financed by the European Union Thematic Programme on Migration and Asylum, aims to arrive at a reliable and evidence-based understanding of the economic impact of immigration in low and middle-income countries.

The project will research the effects of immigration in ten developing countries in Africa, Asia and Latin America. The criteria for country selection include: i) the share of immigrants in the population; ii) the availability of data sources; and iii) the countries' interest in participating. To answer the key questions of how immigration affects the labour market, growth and the fiscal balance in the host countries, the project team will analyse existing data sources and, if required, collect primary data. In order to develop the methodology, the team reviewed the existing literature, carried out an international expert meeting on 23-24 February 2015 in Paris, and organised country-level consultation seminars throughout 2015.

The present paper aims to provide an overview over the current body of theoretical and empirical knowledge on the economic impacts of immigration to developing countries. The review does not discuss cross-generational assimilation nor elaborate on immigrants' integration and integration policies in detail.

The review shows that this topic is still under-researched even though there are reasons to believe that developed and developing economies adjust differently to immigrant inflows. In developing countries, companies may find it more difficult to change their capital stock and hence adjust in different ways; public authorities may be less able to expand their services; and integration costs may be lower as immigrants may be more similar to the native population.

However, it should be kept in mind that these factors as well as the government's policy response can differ strongly between different developing countries and that, as a consequence, the economic impact of immigration also varies. This also implies that the few empirical studies on the subject that have a focus on a developing country cannot be generalised to all or even to most.

The first section in this paper discusses labour market outcomes. The second section examines macroeconomic outcomes with a focus on economic growth, the exchange rate, trade and prices. The last section concentrates on public sector impacts. The conclusion summarises the main results and discusses which aspects merit additional research.

II. LABOUR MARKET OUTCOMES

In debates concerning immigration, questions on whether immigrants displace native workers and cause wages to fall are among the most frequently and controversially discussed topics. While the estimated impacts of immigration on the labour market are typically small, there is no consensus about the mechanisms and the distribution of benefits and costs of immigration.

This section focuses on the effect of migration on the labour market, entrepreneurship, and human capital.

II.1. Labour markets

Although basic economic theory suggest that immigration increases the labour supply, leading to an adjustment of employment and wages, the empirical literature shows that the estimated effects of immigration on labour markets are usually close to zero (Borjas, 1994, 2014; Friedberg and Hunt, 1995; Hanson, 2008; S. P. Kerr and Kerr, 2011; Longhi et al., 2005, 2010)., However, some immigration movements may have a slightly negative impact on low-skilled native workers and prior immigrant cohorts; and coupled with wage rigidity, immigration can result in a negative impact on the employment prospects of native workers.

To understand these empirical results, it is important to capture the theoretical underpinnings. The subsequent discussion follows Bodvarsson and Van den Berg (2013) in broad lines, starting with a strongly simplified model and then relaxing different assumptions.

First, assume a closed small economy with competitive markets and a fixed capital stock owned by native citizens. Suppose further that labour and capital are complementary, immigrants are perfect substitutes for native workers and the native labour supply is perfectly inelastic. Production is characterised by constant returns to scale and additional production inputs are fixed. Under these assumptions, theory predicts that the increase in the labour supply due to immigration will result in increased competition on the labour market and, consequently, a wage decrease but a production increase in the short run. Although native workers will sustain a welfare loss due to the lower wages, total income will increase (immigration surplus), with the welfare gains accruing to the (native) capital owners. The size of these effects depends on the elasticity of the labour demand. A low wage-elasticity entrains smaller losses for native workers, but also a smaller overall immigration surplus.

In the following, it will be discussed how the theoretical conclusions change when the underlying assumptions are altered and as we move from a short- to a long-run perspective.

Substitutability and heterogeneity

When relaxing the assumption of a homogenous workforce, the effect of migration on wages and employment is usually analysed in a two-sector labour market setting with skilled and unskilled labour. If these two types are not substitutable, an increase in the unskilled labour supply decreases wages only in the unskilled sector (substitution effect). It would also increase production, which could lead to an increased demand and higher wages for skilled labour (scale effect). The opposite mechanism would take place if there were a strong inflow of skilled workers.

The substitution effect will depend on the degree to which migrants differ from native workers in their labour market relevant characteristics such as schooling, language abilities, attitudes and preferences, creativity, tacit knowledge, reservation wage and work experience. The evidence regarding the substitutability of migrants and native workers remains mixed. Ottaviano and Peri (2012) provide evidence for imperfect substitutability whereas Borjas et al. (2011) find perfect substitutability between immigrants and low-skilled native workers. Both of these studies concentrate on the United States. For Great Britain, Manacorda et al. (2012) suggest that they are imperfect substitutes. The authors specifically show that immigration has no impact on the returns to education of native workers and present evidence for the substitutability of former and recent immigrants.

Heterogeneity does not only concern production-relevant skills but also general characteristics. Cadena and Kovak (2013) provide evidence that migrants are geographically more mobile and move more readily in response to labour market shocks. This implies that migrants make the labour market more efficient and could even protect native workers from negative labour market shocks.

Most of these empirical studies are conducted at the macro level, which can obscure some micro-level dynamics. There is for example evidence that Italian workers benefit from better work hours as immigrants take less-desired shifts (Giuntella 2012). This would be impossible unless some substitutability was feasible.

The discussion about substitutability and heterogeneity also often ignores the legal status of immigrants, even though the share of undocumented immigrants and the degree to which this restricts their access to certain jobs will shape the effect of labour immigration. Undocumented immigrants will compete with documented immigrants and native workers as long as the lower wage rate that is likely paid by employers is not outweighed by the risk of detection and persecution. Kossoudji and Cobb-Clark (2002) suggest that there are wage differentials between documented and undocumented immigrants of up to 24%.

Quantitative empirical studies on the labour market effects of immigration in developing countries are scarce. Facchini, Mayda and Mendola (2013) find that immigration to South Africa has a negative effect on the native employment rate at the district but not at the national level. No clear conclusion can be drawn with respect to the effect on native wages as estimates vary by

the estimation procedure employed. Independent of the specification, immigration does not seem to affect the income or employment status of self-employed natives. Their findings are in line with the spatial relocation of native citizens from high immigration districts and with the occupational relocation to informal self-employment. Gindling (2009) reveals a slightly negative effect on the wages of native women with low educational attainment in Costa Rica, while there is no evidence for a negative effect of immigration on the wages of native men.

Őzden and Wagner (2014) study the Malaysian economy and uncover a significantly positive effect of immigration for both native wages and employment. However, for native workers with low education, immigration has negative implications. For Malaysia, there are also some relevant descriptive and qualitative studies with a focus on the construction sector. Narayanan and Lai (2005) argue that migrants did not displace Malaysian workers since the latter would not take up the jobs done by migrants. Their analysis concludes that immigration might have slowed wage growth but had no immediate negative effect on native wages. Abdul-Rahman et al. (2012) conducted structured interviews to obtain the opinion of project managers and supervisors in the Malaysian construction sector. They point out that immigration is considered to displace native workers, induce criminal activity and slow down technological advancement. Both papers nevertheless accept that the sector is plagued by labour shortages and that its growth depends on immigrant workers.

Given the prevailing labour market segmentation in developing countries, i.e. the barriers to labour mobility between different sectors of the economy,[1] it is plausible that immigrants will often compete only with a certain sector while leaving others largely unaffected. Since wages in some sectors will have no room to adjust downwards, it is also reasonable to expect an adjustment through employment in the case of direct competition between migrants and natives.

Moreover, South-South migrants often move between neighbouring countries. In Latin America, this implies that immigrants speak their host country's official language, which makes substitutability more likely. Moreover, various international borders were drawn arbitrarily and sometimes cut through ethnic entities. Native citizens might not perceive people moving within their ethnic boundaries as migrants, even when they cross international borders. These migrants may be perfect substitutes for native workers.

Reaction of native workers

The observed effects will also depend on the reaction of native workers, who can exit or enter the labour force, specialise in particular occupations, or migrate.

While neoclassical models often assume perfectly inelastic labour supply workers' responses such as internal migration, task specialisation, and exits and entries into the labour force imply

[1] See Funkhouser (1997), Gindling (1991) and Marcuoiller et al. (1997) for supporting evidence of labour market segmentation in Costa Rica, El Salvador and Peru, and Guatemala respectively, and Maloney (1999) for contrary evidence in the case of urban labour markets in Mexico.

that the local labour supply for a specific job is elastic. Empirically, there is no consensus on how much workers react to the changed labour market conditions by moving out of high immigration regions. Borjas (2006) finds a positive relationship between inflows of immigrants and outflow of native workers in the United States. Using data from the 1960 to 2000 rounds of the population census, he documents an association between the inflow of migrant workers and an increased outflow of native workers. Depending on the specification used, around 2.1 fewer native workers move to a state in response to ten new immigrant workers in said state. Borjas concludes that such reaction of native workers attenuates the effect of immigration on native wages by 40% to 60%. In contrast, Card (2001) presents evidence that immigrant inflows have not altered the inflow or outflow of native workers. His analysis only uses the 1990 census and is restricted to the question of intercity migration (Pischke and Velling, 1997).

It is also possible that to avoid competition, native workers start specialising in tasks in which they have a comparative advantage over migrants. The empirical literature largely bears this out. Peri and Sparber (2009) argue that immigrants specialise in manual labour and that native workers escape the increased competition for these jobs by specialising in occupations characterised by a low content of manual tasks. Their estimations for the United States suggest that an increased share of low-skilled immigrant workers by ten percentage points decreases the supply of manual tasks over interactive by native workers by around two percentage points. Similarly, Foged and Peri (2015) found that in response to refugee inflows in Denmark, less educated native workers moved to jobs that had less manual content.

In a similar fashion, Amuedo-Dorantes and de la Rica (2011) estimate that in Spain, a standard deviation increase in the share of immigrant workers decreases the relative supply of manual tasks over interactive tasks of native men by up to 1.3% and of native women by up to 2.7%. Looking at 15 European countries, D'Amuri and Peri (2014) find the same pattern of immigration, which induced uptake of jobs with a higher content of interactive tasks by native workers. According to their estimates, a doubling of the share of immigrant workers and the resulting job upgrading of native employees lead to an increase of native wages by 0.7%. There are also examples at the micro level that document a displacement of native workers from specific occupations. Federman et al. (2006) find that in California, the inflow of Vietnamese migrants into the market for manicurists seems to have discouraged non-Vietnamese workers from entering.

Native citizens can also benefit from the specialisation of immigrants in certain trades. For Italy, Barone and Mocetti (2011) argue that the increased female labour participation can be attributed to household services provided by female migrants. The authors show that Italian women work more at both the extensive and the intensive margin because an increased supply of housekeeping and childcare services lowered their costs. Studies focusing on the work hours (Cortés and Tessada, 2011) and fertility decisions (Furtado and Hock, 2010) of women in the US point in the same direction.

Among the scarce evidence about the reaction of native workers in developing countries is one recent paper by Tan and Gibson (2013). The authors estimate that the female labour force

participation rate in Malaysia is between 13 and 26 percentage points higher because of the presence of foreign, primarily Indonesian, housekeepers. The previously mentioned study by Facchini, Mayda and Mendola (2013) finds that immigration induces native citizens to move internally but not internationally.

Labour market institutions

Until this point, the discussion has only focused on a basic supply and demand model with full market clearing. It is also possible that a number of institutions such as labour laws, minimum wage laws and labour unions affect wage setting. If, for example, minimum wages are binding and there is no excess demand for labour, an increase in the supply of unskilled labour will lead to unemployment since the total number of available positions is fixed at the minimum wage level.

Labour market institutions, such as minimum wages, unemployment insurance and employment protection, differ substantially across countries and time. There is also substantial variation within countries over time and across regions. Due to the strong variation in the types of institutions, it is not even possible to group countries into generic categories (Aleksynska and Schindler, 2011). Focusing on Europe, Boeri and Brücker (2005) argue that immigration into rigid labour markets can increase unemployment and decrease wages and thereby create substantial losses for native workers. Their analysis also shows that almost independently of labour market regulations, capital owners gain from migration. Angrist and Kugler (2003) also analysed the effect of immigration on wages conditional on different labour market institutions in 18 European countries. They show empirically that the effects of immigration can become negative for native workers when labour markets are not flexible. Their results also suggest that it is not only labour market regulations but also the institutions governing the product market that determine the effect of immigration. Both Prantl and Spitz-Oener (2014) and Bratsberg and Raaum (2012) show empirically that sectors characterised by firm entry restriction remain unaffected by large scale immigration. Conversely, wages decrease significantly as a reaction to the large-scale immigration entry for sectors where free firm entry into the product market takes place.

In some developing countries, the relative role of self-employment and unpaid family work versus wage employment is larger, wages are low and income streams uncertain, and women are strongly disadvantaged (Behrman, 1999; Fields, 2011). Transferring the predictions of competitive market models and empirical evidence from developed countries to developing countries might therefore prove difficult (Boeri et al., 2008; Freeman, 2010). Additionally, the informal sector is an important aspect to be taken into account when analysing labour markets in developing countries (Jütting and de Laiglesia, 2009).

Adjustment of production

On the tope of wages and employment, adjustment mechanisms to immigrant inflows include capital adjustments, changes in the output mix, and changes in production technologies.

For example, the base model assumes the constancy of capital. In a standard neo-classical growth model, an increase in labour will decrease the returns to labour but at the same time increase the marginal return to capital. This will ignite an inflow of capital. In the long run, the resulting increase in labour demand will return the capital-labour ratio and hence wages to the level observed before the influx of migrant labour. The size and duration of the effects of immigration on the labour market will therefore depend on the speed of capital adjustment (Brücker and Jahn, 2011; Ottaviano and Peri, 2012). Empirical evidence of a relatively quick capital adjustment in response to an immigrant inflow is for example provided by Olney (2013): a 10% increase in the share of low-skilled immigrants in a city is associated with a 2% increase in the number of establishments. It must be noted that this adjustment process depends on the production setup and financial market conditions. If the benefit for capital investments is too small because of high transaction costs, no capital adjustment will take place.

When extending the standard model to more than one good, it also becomes possible that industries adjust their output mix (Card, 2005; Dustmann et al., 2005). If there is an inflow of unskilled workers, firms producing (unskilled) labour-intensive goods would expand and wages would return to pre-migration level. This presupposes that firms can sell the additional products locally or abroad.

Another possible adjustment is industry production technologies. Hanson and Slaughter (2002) demonstrate that migration flows between 1980 and 1990 in the United States were absorbed through within-industry changes of the production technologies. Lewis (2003) comes to the same conclusion that a change in production technologies rather than in trade is the primary adjustment channel. Similar results that production adjustments account for the absence of wage adjustment is found for Spain (González and Ortega, 2011) and Israel (Gandal et al., 2004). All of these studies are done at the industry level. This is potentially problematic since it captures neither the heterogeneity of firms nor the entry and exit of firms into the industry. Dustmann and Glitz (2011a) confront these problems by looking at firm level data from Germany. They also do not find significant changes in prices of tradable goods and consequently interpret this finding as evidence for an adjustment in production technology.

In conclusion, the more flexible the economies are, the more likely it is that there are no negative effects. For developing countries, a couple of obstacles could make this adjustment process difficult. First, the free availability of capital seems to be questionable given that financial markets in many countries are still insufficiently developed (e.g. Beck et al., 2009). In addition, capital adjustments depend on the confidence of investors in a specific market. If property rights are weak or the economic outlook is uncertain, investors may discount their possible returns strongly and refrain from adjusting their production setup. Second, the trade structure might not be open enough to accommodate a significant change in the output mix. Third, even the absorption of additional labour by for example the manufacturing sector seems questionable given the low employment growth in many developing countries. As recently discussed by Iacovone et al. (2013), firm growth in developing countries seems to be partly limited by an unfavourable business environment and a lack of basic infrastructure.

Moderating factors

The discussion so far makes it apparent that the theoretical predictions depend critically on the assumptions made with respect to the degree of substitutability of native and migrant workers and the structure of the migrant receiving economy. The results are also hard to generalise since the composition of the migrant workforce is shaped by the self-selection into migration, which varies depending on country-specific factors and the prevalence of migration networks that might change over time.

Additionally, a few confounding factors need to be taken into account when estimating the effect of immigration on native labour markets. The two most important are the mismatch of migrants skills and occupation, and the legal status of migrants.

Migrant skills, qualification and occupation mismatches

Skills and occupations of migrants could be mismatched since their skills may lack transferability or their degrees may not be recognised in the host country. As a consequence, high-skilled migrants might compete with low skilled natives (Chiswick and Miller, 2008). The mismatch could also be one explanation for the observed positive impact of immigration on native wages (Dustmann et al., 2012). Due to the occupational downgrading, migrants will receive a wage that is lower than their marginal productivity.

Aleksynska and Tritah (2013) present evidence for occupation-education mismatches of migrants in 22 European countries. They show that the degree of the mismatch is conditional on the prevailing labour market institutions and conditions. The distribution of over-qualified migrants and native workers in the different occupations converges over time with an increasing on-the-job experience. Interestingly, there is strong evidence that the size of the informal sector is an important determinant of the over-qualification of migrants. The bigger the informal sector, the higher is the likelihood of finding highly educated migrants in low-skill occupations. The authors hypothesise that this effect could be due to the limited recognition of formal education in the informal sector.

The importance of this mismatch is also dependent on the prevalent self-selection patterns. A strongly negative self-selection and the resulting inflow of primarily low-skilled migrants would render the discussion on mismatches irrelevant. This could be the case for many countries in the global South.

Legal status of migrants

The second aspect that analyses often omit is the legal status of migrants. It is often assumed that undocumented migrants primarily work in the informal sector. However, Venturini (1999) shows that in Italy, native employment in the informal sector is as common as migrant employment. Nevertheless, it seems reasonable to expect that the legal status of migrants will entail also a significant divergence of wage and marginal productivity. In fact, wage penalties for being an undocumented migrant compared to being a documented one have been estimated to

be as high as 24% (Kossoudji and Cobb-Clark, 2002), although other estimates have been much lower (Barcellos, 2010).

There is little empirical evidence on the effect of undocumented immigration on native wages or employment due to the difficulties of measuring the independent variable i.e. the presence of undocumented workers. Hanson et al. (2002) show that border enforcement in the United States, which should have a direct effect on the presence of undocumented workers, does not seem to be correlated with the native labour market outcomes. The authors conclude that there is no observable effect of undocumented workers on native workers. More recently, Chassamboulli and Peri (2014) show that deportation as a reaction to irregular immigration appears to have negative effects on the labour market opportunities of native citizens. They argue that the disruptive character of deportation discourages employers from job creation.

Due to a lack of administrative capacity, porosity of borders and the large informal sector, it is not clear how much the legal status of migrants in developing countries matters. Hence, the differentiation between undocumented and documented immigrants might not make a difference for the analysis of the impact of immigration on labour markets. However, the disruptive nature of large-scale deportations of immigrants could be as pronounced in developing as in developed countries.

II.2. Entrepreneurship and self-employment

There is mounting evidence that self-employment can contribute to per capita income and job growth in developed countries (e.g. Neumark et al. 2011; van Praag and Versloot, 2007). Small-scale enterprises and self-employment[2] are therefore an important aspect in the analysis of the economic impact of migration. However, it also needs to be noted that van Stel et al. (2005) suggest that the economic growth effect of self-employment are negative in poor countries and positive in rich countries. These results indicate that immigrant self-employment in developing countries might not always be beneficial to economic growth.

In fact, the economic importance of entrepreneurs and small enterprises in developing countries seems to be more and more acknowledged (Nichter and Goldmark, 2009; Naudé, 2010). More than 70% of all workers in low-income countries are self-employed (or non-paid employees). In developed countries, this figure stands at approximately 10%, while the rates in middle-income countries are in between these two figures. The main sectors of activity of self-employment in developing countries are retail and manufacturing (Gindling and Newhouse, 2014).

Self-employment rates are often higher among immigrants than among native workers in a number of different countries (e.g. Andersson and Wadnesjö, 2004), with exceptions such as Ireland, Spain and Greece (Muñoz de Bustillo and Antón, 2010; OECD, 2011a).

2 To facilitate the presentation, the terms entrepreneurs, self-employed and own account workers are used interchangeably.

Most of the existing studies do not differentiate explicitly for the composition of migration flows. An exception is Lofstrom (2010), who distinguished the outcomes by gender. He finds that in the United States in 2007, low-skilled foreign- and native-born men have roughly equal self-employment rates of 10-11%. The rate for foreign-born women (6.1%) is lower than for native women (10.6%). Interestingly, his analysis reveals that the earnings of low-skilled male immigrants is between 13% and 26% higher if they are self-employed compared to wage employment. This difference is only 7–11% for women. Other distinctions worth exploring are the educational background and the legal status of immigrants, as discussed earlier. Some evidence points to a positive correlation between the number of years spent in the country of destination and the likelihood of being self-employed. One possible reason is that recent migrants do not have the financial resources to start a business, but accumulate them over time (Borjas, 1986). Another possibility is that many recent immigrants enter the country on employment-dependent visas, and are only able to become self-employed once they are able to switch to a different type of visa.

Explanation of migrant entrepreneurship and self-employment

There are three primary explanatory approaches to migrant entrepreneurship (Zhou, 2006). The first attributes entrepreneurial activities and self-employment to endogenous characteristics and socialisation, the second emphasises the marginalisation and discrimination of migrants and considers self-employment as a last resort, and the third focuses on the importance of enclaves and ethnic segregation. Determining which of these causes is dominant is of more than just academic interest. It has been established that opportunity forms of entrepreneurship are more conducive to economic growth than necessity forms (Acs, 2006; Wong et al., 2005). Hence, if marginalisation is the primary driver of migrant self-employment, its economic contributions might be limited.

First, if migrants have certain characteristics that are different from natives, this could be a prime candidate for explaining the high self-employment rates of migrants. Since self-employment is more likely for young and well-educated individuals in several OECD countries (Le, 1999), positive self-selection into immigration is likely to entail a high proportion of self-employed migrants. Migrants could also be self-selected with respect to certain unobservable characteristics that increase the likelihood of self-employment. For example, a certain level of risk tolerance seems to be a defining characteristics of entrepreneurs (Brown et al. 2011). At the same time, geographically mobile people have been shown to be more risk tolerant (Jaer et al., 2010). It is therefore reasonable to expect immigrants to have a higher propensity to be self-employed than natives.

A number of papers have also analysed the intergenerational mechanisms of self-employment. There is no consensus with respect to this question in the literature. Andersson and Hammarstedt (2010) show that third-generation migrants in Sweden still have a higher self-employment propensity if their fathers or grandfathers were self-employed. Contrary to this finding, Hout and Rosen (2000) show that the self-employment status of a migrant's father does not have much explanatory value for the self-employment of migrants in the US.

It is also possible that immigrants have a higher tendency to become self-employed due to self-employment experience before their arrival in the country of destination. Using the relative self-employment rate in the country of origin compared to the US as a proxy of previous self-employment, Yuengert (1995) presents strong evidence for this hypothesis. The author proposes that a greater preference for self-employment could explain this finding. Akee et al. (2013), who directly identify exposure to self-employment at the individual level, also find a strong effect of self-employment experience in the home country on the inclination to become self-employed in the country of destination. To be precise, they calculate that immigrants with this kind of experience are 7% more likely to be self-employed relative to other migrants without this experience.

This finding suggests that immigrants from countries with a high level of self-employment have a higher propensity to open their own business upon arrival. Oyelere and Belton (2012) differentiate between immigrants from developing and developed countries in their analysis of immigrant self-employment in the United States. They present evidence that the propensity for self-employment among immigrants increases with the human development index of the country of origin despite the fact that self-employment is higher in countries with a low human development index. The authors hypothesise that this effect is due to the institutional similarity of developed countries, which facilitates the transition into self-employment for immigrants from other developed countries.

Second, high self-employment rates could also be a result of migrant marginalisation and entry barriers into (skill-appropriate) wage employment. Self-employment thus becomes a more profitable alternative or even a last resort for immigrants.

Empirical evidence provides some support for this hypothesis. Lofstrom (2002) calculates the lifetime earnings of salaried and self-employed migrants and natives in the United States between 1980 and 1990. Although he could not find any statistical difference for the predicted earnings of self-employed natives and immigrants, he reports that immigrants are likely to earn between 10.8% and 15.3% less in salaried work than natives. Clark and Drinkwater (2000) also use predicted earnings to study self-employment among immigrants in England and Wales. Their analysis also suggests that discriminatory wages push migrants into self-employment.

Blume et al. (2008) investigate the transition probabilities of non-Western immigrants into and out of unemployment in Denmark, showing that immigrants have a higher probability of exiting unemployment by becoming self-employed. They furthermore estimate that approximately one third of the immigrants from Turkey, Pakistan and Viet Nam, for example, are self-employed because they were marginalised in the labour market.

Self-employment in developing countries is often portrayed as a last resort for the marginalised due to the lack of adequate formal wage work, although other authors draw a contrasting picture. Mohapatra et al. (2007) show that self-employment as a share of the total labour force in rural China has been increasing from around 4% in 1981 to about 16% in 2000. The authors show that high productivity self-employment rather than low-capital activities

primarily drive this growth. They conclude that self-employment growth in China is not the result of economic distress but an outcome of modernisation and development promotion. It needs to be noted that political barriers supressed entrepreneurial behaviour in China for many decades, and that the marginal entrepreneur in China may thus not be representative of the marginal entrepreneur in other countries.

The third theory looking at enclave effect states that immigrants represent a specialised consumer group that creates a demand for products and services not provided by natives. Enclaves, i.e. the geographic concentration of large numbers of co-ethnic immigrants, create a niche market. It is further argued that immigrants have a comparative advantage in providing these products and services based on information asymmetries with respect to language and knowledge of preferences. The enclave effect could also work through the improved access to a labour force that speaks the same language and is culturally close to the entrepreneur or even part of his extended family. This constellation facilitates hiring and could possibly also decrease the risk of shirking (Borjas 1986).

The empirical results on the importance of enclaves for self-employment are not conclusive. On the one hand, a number of studies from different countries find an increased propensity of migrants to be self-employed (Andersson and Hammarstedt, 2011). Lofstrom (2002) calculates that a 1% increase in the proportion of Mexicans in the vicinity of a Mexican migrant increases her self-employment probability by approximately 0.1%. On the other hand, there is also a number of papers that reject the enclave effect (Yuengert, 1995; Blume et al., 2008; Clark and Drinkwater, 2000), either because the comparative advantage migrants have in providing goods and services for their co-patriots is not as big as one might expect,[3] or because the demand is not sufficient to require specialised provision by migrant entrepreneurs. It is also important to note that the importance of enclaves will be proportional to their size as a small number of co-ethnic neighbours might not be sufficient to sustain a business.

Most available studies omit some factors. One problematic omission is the failure to distinguish between different types of industries. This is despite the fact that prevailing entry barriers, which differ substantially between sectors and industries, will affect the decision to enter self-employment. Accordingly, self-employment draws individuals toward certain sectors depending on their characteristics and endowments (Lofstrom et al. 2014). The legal status of migrants is another aspect often not taken into account. Fairlie and Woodruff (2010) represent a notable exception. The authors show that the rate of self-employment among Mexican-born individuals in the United States almost doubled from 3.1% to 5.8% after a large-scale legalisation.

Externalities of immigrant self-employment

Apart from the drivers of self-employment, there is only a small literature on the externalities of immigrant self-employment. Theoretically, immigration could foster

[3] Clark and Drinkwater (2000) point out that only 17% of the enterprises in their British sample stated that they produced "specialist ethnic" goods and services.

entrepreneurship among natives. Duleep et al., (2012) suggest a model in which immigrants' skills do not fully translate to the host country, but in which these non-transferable skills nonetheless enhance an individual's learning ability. Entrepreneurs can benefit from this situation by hiring immigrants that have an above average learning ability for a given wage level. This is particularly beneficial in the context of innovative entrepreneurship. Moreover, the increased competition through the presence of migrant entrepreneurs might push existing native firms to become more innovative and productive (Nathan, 2014). Finally, entrepreneurship of immigrants that leverages skills from their home country may create new economic activities in the country of destination and thereby open new opportunities for native employment and entrepreneurship as well. For example, Bolivian immigrants (re-)introduced horticultural activities to many parts of Argentina where these had not been previously undertaken (Chiarello, 2011). On the other hand, increased competition could also displace native firms. Fairlie and Meyer (2003) document a pronounced displacement effect, but also show that the earnings of self-employed natives that stay in business are not affected. On a related note, Brown et al. (2009) report that firms employing undocumented migrant workers seem to have a cost advantage over enterprises that do not.

For developing economies, the available literature on the nexus between international immigration and entrepreneurship is scarce. One recent exception is Thomas and Inkpen (2013). Using data from Malawi, the authors find that immigrants from other African countries and particularly from countries not belonging to the Southern African Development Community are more likely to be self-employed than internal migrants in Malawi. Since the analysis does not use native non-migrants as a reference group, these results are only suggestive. Frijters et al. (2011) is another exception. The authors analyse the entrepreneurship propensities of internal migrants in 15 Chinese cities. Their data suggest that around 28% of migrant workers are currently self-employed. Compared to urban residents, migrants are three times more likely to be entrepreneurs. The analysis also shows that capital constraints prevent 22% of the migrants who are in wage employment from becoming self-employed. The authors take up an important concern about the limited growth potential of micro-enterprises in developing countries due to capital constraints and the access to external finance that have also been highlighted elsewhere in the literature (Grimm et al., 2012). These constraints create a strong pressure to rely on internal capital flows to finance investments. For immigrants, this could be especially difficult as they face the obligation to save for their return or to support their families in their country of origin and as they may have even less access to formal and informal financing than comparable native citizens. If the (migrant) businesses fail to grow, their impact on economic growth will remain negligible.

II.3. Human capital effects

Another paramount aspect for the long-term economic impact of immigration is its effect on the human capital distribution in general and on the education of natives specifically. Macroeconomists have incorporated human capital into their growth models for over two decades. Among the effects identified are the adoption of new technologies, the effect on health and fertility and not least the productivity of workers.

There are few studies that systematically compare the skill distribution of native citizens versus immigrants across the developing world. A study on Malaysia (World Bank and Ministry of Human Resources of Malaysia, 2013) finds that immigrants are significantly less educated than native citizens. The same is argued by Bryant and Rukumnuaykit (2007) for Thailand. For South Africa, in contrast, Facchini et al. (2013) report a bifurcated distribution of immigrants, where immigrants are over-represented among those without a primary and with a secondary and university education, while for Nicaragua, immigrant workers have also more frequently obtained a secondary or tertiary degree than native workers (Gindling, 2009).

Moderating factors

Clearly, the size and composition of migration flows can have non-negligible effects on the human capital distribution of a country. Depending on the self-selection of migrants and the admission policies, the human capital stock of the host country can either increase or decrease in the short run. In the long run, fertility decisions and investments in education undertaken by migrants, their labour market placement and performance, and their return patterns determine their impact on the human capital distribution (Chiswick, 1989; Fuest and Thum, 2001). This impact is also moderated by the transferability of skills of immigrants and the investment of immigrants in education after their arrival in the country of destination (Dustmann and Glitz, 2011b). The most important mechanisms that connect immigration and the human capital of natives are the transfer of knowledge, the adjustment processes of workers due to a changing optimal level of human capital and the effects of migrants on the schooling system. Stolz, Baten and Botelho (2013) provide empirical evidence that the late-19th and early-20th century immigration to Brazil still has repercussions on Brazil's 2000 real GDP, partly owing to human capital spill-overs and path dependency.

There are several theoretical mechanisms how immigration could affect the education of natives. First, due to an increased competition in the low-skilled sector and higher returns to education as a result to the increased demand for high-skilled workers, native citizens might increase their investments in education. The effect of an increase in the number of unskilled workers depends on the degree of substitutability between different types of workers (Bretschger, 2001). An increase in the number of educated immigrants raises the wages for all high-skilled individuals in the economy, which also induces native citizens to invest more into education thanks to the rising education premium (Miyagiwa, 1991).

For example, according to a recent report (World Bank and Ministry of Human Resources of Malaysia, 2013), Malaysia was able to leverage its immigration for an increase in the educational levels of its citizens. On the other hand, there exist models in which workers supply unskilled labour as well as human capital, a temporary increase in unskilled immigration leads to a short-term increase in output as the economy substitutes away from investing into human capital in favour of an increased production (Robertson, 2002). A variant of the Reichlin and Rustichini (1998) model with heterogeneous labour suggests that depending on the skill distribution of the initial immigration inflow, the impact on the receiving country can change and permanently alter the skilled to unskilled workers ratio.

Second, when immigrant children attend public schools, resources may be diluted. Larger classes and other such effects may worse the quality of education (Urquiola, 2006) Expansions of the education budget and peer effects between migrant and native children might moderate this effect. Native students' learning could be affected through the spill over of aspirations and motivations from their peers. However, there is no clear a priori for the effect of variance of ability on overall student performance.

Third, parents might also adjust to the new situation and enrol their children in private education institutions. The empirical tests of these hypotheses do not create a clear picture. For example, Geay et al. (2013) study the educational attainment in England using data on primary schools. They show that most of the negative correlation between native performance and presence of students whose first language is not English is due to selection. After including a number of control variables related to student demographics and school characteristics, the initial effect becomes insignificant and converges to zero. Cebolla-Boado and Medina (2011) and Contini (2013) come to similar conclusions in studies on Spain and Italy. Hunt (2012) looks at the long-term effects on both performance and enrolment based on U.S. state panel data from 1940 to 2010. Her estimations suggest that increasing the share of migrants aged 11-64 by one percentage point augments the probability of native students to complete 12 years of formal education by 0.3 percentage points. There are other studies for countries such as the Netherlands (Ohinata and van Ours, 2013) and Norway (Fekjaer and Birkelund, 2007) that find either no or slightly positive effects on native student performance due to the presence of students with a migration background.

However, a number of studies also detect negative effects. Following the 5th grade cohorts of 1994 until 2001 in Israel, Gould et al. (2009) report a statistically significant small negative marginal effect of the presence of Russian immigrants on the probability of passing the high school matriculation exam. A 10% increase in immigrants lowers the high school matriculation rate by 1.5–1.8% over a base rate of around 61%. To address the sorting issue, the authors exploit the supposedly random variation of immigrant children in different grades in the same schools.

As pointed out earlier, native citizens will adopt to the inflow of immigrants by adjusting their choices. The effects will depend on the composition of immigrants. If the migrants are primarily from the lower end of the education distribution, it can be shown that an increase in the enrolment in private schooling is to be expected (Dottori et al., 2013).

Native flight, education expenditure, and educational outcomes

Using the US micro census, Betts and Fairlie (2003) analyse the state-level enrolment rates of public and private educational institutions in 1980 and 1990. They find no effect of immigration on primary schools but a strong and significant crowding out ("native flight") in secondary schools. They calculate that for every four immigrant children who arrive at a public secondary school, one native child switches to a private school. Gerdes (2012) repeats this exercise using the refugee inflows into Danish municipalities between 1992 and 2004. He finds a small effect that is primarily found in small and medium sized schools but not observable in large schools.

Cascio and Lewis (2012) go a step further and discuss the movement of whole households out of high migration school districts. Their analysis of Californian school districts for the period of 1970 to 2000 suggest that what the authors call low-skilled Hispanic settlement drives out native families, who move to other school districts. Hook and Snyder (2007) also focus on California and present a more differentiated effect. They show that the "native flight" due to the presence of Spanish speaking and Hispanic students takes place at the school level when looking at secondary schools and that it is only observable at the district level when looking at primary schools.

A related effect concerns the nexus between the inflow of (immigrant) students and public spending on education. It has been shown theoretically that an increase in the diversity of the population can lead to a decrease in the spending on shared public goods due to diverging preferences on the public good provision (e.g. Stichnoth and Van der Straeten, 2013). Empirically, Speciale (2012) investigates the effect of immigration on public education expenditure in 15 European countries. Exploiting the exogenous inflow of migrants in the wake of the 1990s Balkan wars, he finds that there is a small negative effect. More precisely, he estimates that a one percentage point increase in the share of immigrants has led to a decrease of public spending on education by 0.15%. This seems to be independent of the effect of immigration on the tax base or revenues. More drastically, for California, Coen-Pirani (2011) predicts that education spending per student would have been 24% higher in 2000 if immigration had remained at the level that it was three decades previously. Similarly, Tanaka, Farré and Ortega (2014) predicted that immigration and the naturalisation of certain immigrants lead to a reduction of 11% in public spending In both cases, the effect is composed of a direct dilution due to an increased number of students but also tax-rate related voting behaviour.

Baez (2011) is the one of the few papers that looks specifically at the effect of immigration on native educational outcomes in a developing country.[4] He finds that the inflow of half a million refugees from Rwanda and Burundi into the northern region of Tanzania had strong detrimental effects on years of schooling and literacy of native children. This is a special case since the incentives and decision process of refugees do not necessarily reflect those of labour migrants. As in developed countries, a consequence of the inflow of immigrants might be a shift away from public schools to either private or religious schools. However, when there is no alternative to public schooling, the decrease in school quality might lead to decreasing achievements and an increased dropout rate (Hanushek et al., 2008). It is also possible that public funds are adjusted to the new composition of the school populations. Miguel and Gugerty (2005) document a negative effect of ethnic diversity on the resource endowment of schools. This might be especially difficult since school inputs could be particularly important in a context of education systems that suffer

[4] Public education in developing countries is different from that in industrialised nations in various respects (Glewwe and Kremer, 2006; Glewwe, 2002; Orazem and King, 2007). On the demand side, enrolment rates are low. On the supply side, the quality of schooling regarding basic supplies such as textbooks and blackboards as well as the quality of teaching is often lower than in developed countries.

from low resource endowments (Fehrler et al., 2009). Basic endowments such as schoolbooks still have a strong effect on student performance.

III. MACROECONOMIC OUTCOMES

Although less in the public focus, the effects of immigration on economic growth, productivity, the exchange rate and prices are potentially as important as the labour market dynamics of immigration. The analyses of these effects allow us to make statements about worse-off and better-off population groups as a result of migration and whether the country as a whole gains or not.

III. 1. Productivity and GDP

An expansion of the workforce will almost invariably increase a country's total output level, as shown by Borjas (1999a) and Smith et al. (1997), for example. The question of interest is therefore not whether labour immigration raises total GDP, but whether it positively or negatively affects the level and growth rate of the host country's real per capita income.

The following discussion is about the possible effects of immigration on per capita GDP through its effects on aggregate supply, productivity and aggregate demand. The section ends with a discussion of the existing empirical evidence.

Aggregate supply

a. Capital stock

The first factor that affects aggregate supply is the capital stock. Population growth initially lowers the capital-labour ratio. Under the assumptions of constant returns to scale, as in the Solow growth model, this leads to a temporary decline in per capita GDP (Reder, 1963; Dolado et al., 1994; d'Albis et al., 2013).[5] In the long run, the effect will disappear as the initial capital scarcity leads to higher returns to capital and hence to higher investment incentives.[6]

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5 For a detailed discussion of the Solow growth model and immigration's effect under this model's assumptions, please consult Bodvarsson and Van den Berg (2013).

6 It is also possible that the capital adjustment already occurs before the arrival of the migrants if firms simultaneously undertake capital investment and active recruitment of foreign workers (Tapinos, 1974). This is most likely the case in situations of guest-worker migration such as in several European countries during the 1950s through the 1970s. A contemporary example may be immigration from China to African countries that occur concurrently with large infrastructure projects. More generally, if immigration is business-cycle driven and immigrants tend to leave in a downturn, overall welfare of the domestic population would be improved through immigration (Malchow-møller and Skaksen, 2013).

The speed of this adjustment process depends on the characteristics of the receiving country's economy and of the immigrant flow. On the side of the economic structure, the process is faster for small and open economy (Australian Productivity Commission, 2006). Under these circumstances, foreign capital can easily enter the country, and the financial inflows that are required to adjust to the new labour force size will be too small to change the price of capital on the world market.

Regarding the characteristics of the immigrant flow, first, immigrants might themselves bring financial capital into the country to invest into their own or someone else's entrepreneurial venture, counter-acting capital dilution (Moody, 2006). Second, immigrants may encourage foreign direct investment (FDI) from abroad through providing information about business opportunities to investors in their country of origin and through lowering transaction costs (Baez, 2011; Javorcik et al., 2011; Nathan, 2014). This effect could be lessened if migration encourages FDI from the host to the home country (Kugler and Rapoport, 2007). Third, since a country's average savings rate can be influenced by its age structure, an influx of younger or middle-aged workers could lead to an increase in overall savings (Boubtane and Dumont, 2013). Finally, if immigrants intend to return to their home countries, they tend to save more. This raises disposable capital if they do not immediately repatriate the additional savings as remittances (Drinkwater et al., 2003).

In developing countries, some of the mitigating factors that can speed up the capital adjustment after an immigration wave may not be present. Slower capital adjustment, of course, implies that the capital dilution and the associated lowering of per capita income persist for a longer time. The financial openness of developing countries is on average lower than in industrialised or emerging economies, but the variation across countries is substantial (Chinn and Ito, 2008). Even a small, open developing economy may not experience the optimal level of capital inflows, as for various reasons, overall capital inflows to developing countries have been subject to substantial variations over the past few decades that were not always related to internal conditions in those countries (Fernandez-Arias and Montiel, 1996; Taylor and Sarno, 1997). Moreover, the internal allocation of capital in the country is often inefficient due to credit constraints that make it difficult for small and medium-sized enterprises to undertake profitable investments, although the extent of these inefficiencies is unclear (for empirical assessments, see for example Levy (1993) on Sri Lanka's leather industry and Tanzania's furniture industry). This entails that firms may not be able to adjust their capital levels quickly to an immigration influx.

b. Labour supply

The second important factor to consider is the labour supply.

The impact of an expansion of the labour force on the growth rate of an economy depends on the returns to scale. If there are constant returns to scale and labour is homogenous, an increase in the number of workers increases the overall gross domestic product, but there would be no permanent increase of the economic growth rate (Borjas, 1999a). If there are increasing returns to scale, the situation changes. Increasing returns to scale is a frequent feature of

endogenous growth models, which are based on the premise that long-term growth can exist and is not driven by an exogenously given rate of technological change (Romer, 1994).

Brezis and Krugman (1996) propose a model of an open economy that produces both traded goods and non-traded intermediary goods that are subject to increasing returns to scale. In this model, as in the model with constant returns to scale, immigration will initially lead to a fall in real wages, but in the long run, real wages will increase while returns to capital will remain at the world rate. This is in contrast to Reichlin and Rustichini (1998), whose model also assumes increasing returns to scale but additionally endogenises immigration. In this context, increasing wages due to a growing labour force becomes a self-perpetuating process as they attract more immigrants, which leads to further wage growth.

In another two-country model, in which firms in both countries engage in research and development (R&D) races, immigration increases economic growth if the immigration itself is driven by differences in the population size (with larger countries having higher average income). In contrast, it will decrease growth if the higher average income in one country compared to the other is driven by policies such as tariffs or R&D subsidies (Lundborg and Segerstrom, 2000).

Other models depart from the assumption that labour is homogenous. In this scenario, if there are constant returns to scale and the supply of capital is perfectly elastic, GDP per capita of native citizens rises the most if immigrants are as unlike native workers as possible. In contrast, if capital is perfectly inelastic and the native population is not predominantly skilled, the native per capita income gain is largest when the immigrants are as skilled as possible. If there is not a constant stream of new immigrants, this does not represent a permanent increase in the growth rate (Borjas, 1999).

However, the preceding model did not take into account that over longer periods, the skill distribution of the population is not given and instead needs to be invested into. As discussed in the human capital section, immigration can itself affect educational investments.

A variant of the constant returns model is presented by Klein and Ventura (2009). In their model, land is added as a third (fixed) input so that returns are jointly decreasing in labour and capital. In this scenario, immigration lowers output per worker whether or not labour is homogeneous. However, the authors acknowledge that over time, changes in technology could alter the production function so that this negative relationship need not hold in the long run. In the short run, land may nonetheless represent a real constraint particularly in developing countries. In some of them, little land is left that could be added to agricultural production (Young, 1999). Moreover, acquiring or leasing land for business uses may be subject to substantial administrative barriers that raise the financial and time costs when trying to start or expand a business (Morisset and Lumenga-Neso, 2002).

Other models assume heterogeneous labour in combination with increasing returns to scale. In a model that incorporates a consumption sector with constant returns to scale and a research sector (which uses predominantly skilled workers) with increasing returns to scale, an increase in

the number of skilled workers raises economic growth in the medium and long run. The effect of an increase in the number of unskilled workers depends on the degree of substitutability between different types of workers (Bretschger, 2001). Another model by Miyagiwa (1991) relies on the assumption that there are increasing returns to education, as mentioned in the Chapter II. An increase in the number of educated immigrants raises the wages for all high-skilled individuals in the economy, which also induces native citizens to invest more into education thanks to the rising education premium.

The effect of labour immigration on the supply of labour can go beyond the mere increase in the number of workers of different skill groups or even the second-order effects of changes in the native skill distribution in response to immigrant inflows, as discussed in the human capital section. First, immigration may generate efficiency gains through increased specialisation in the labour force, which could boost per capita income levels (Hanson, 2012; Peri, 2012). Second, immigrants may be more reactive to labour market imbalances than native workers and might improve the regional allocation of labour through internal migration (Borjas, 2001). Third, when moving beyond the binary classification of employees as low- or high-skilled and when instead considering that there are a large variety of positions that require a specific combination of experience and skill, immigrants may be able to fill jobs for which there is a shortage of qualified native workers. This could potentially boost per capita income and economic growth (Drinkwater et al., 2003).

Whether or not immigrants in developing countries allow increased specialisation, whether they are more responsive to labour market imbalances, and whether they fill any previously unfilled jobs are empirical questions that appear not to have been studied yet.

Finally, changes in the aggregate output of the economy can themselves engender changes that alter the country's per capita income levels and growth rates. For example, if there are large increases in output of a good and if the country produces a sufficiently large share its global output, this could lower the product price and worsen the country's terms of trade. This would negatively affect real wages, while the return to capital rates would stay neutral, thereby lowering income per capita (see also Friedberg and Hunt, 1995).

Productivity and technological change

Immigration can also affect technological change and the productivity of the economy. The mechanisms through which this could occur include a younger workforce, higher entrepreneurship levels, technology transfers, and higher levels of innovation through the migrants themselves or through spill-over effects.

First, the change in the composition of the workforce can have productivity effects. As shown empirically by Feyrer (2007), increases in the share of certain age groups – for his sample, the 40-49 age group – in the workforce can be associated with higher productivity growth. Immigrants are often relatively young and might thus temporarily boost productivity. On the

other hand, communication barriers and a potential lack of trust between immigrant and native workers could negatively affect firms' productivity.

Second, immigration could entail technological transfers. For example, Hornung (2014) demonstrates that the Huguenot immigration to Prussia in the late 17th century led to long-term productivity improvements in textile enterprises, and argues that this occurred through a transfer of technology. In addition to new production technologies, immigrants may also introduce knowledge of "market-supporting institutions" (Kang and Kim, 2012) that increase productivity. This knowledge transfer may be especially strong if specific experts are hired by firms to impart knowledge (Markusen and Trofimenko, 2009). On the other hand, if immigration reduces wage growth, it could reduce the incentives for employers to invest into labour-saving technologies (cf. Ortega and Peri, 2009; Tapinos, 1974).

Third, immigration can also contribute to increasing the level of innovation in the economy if migrants themselves engage in innovative activities or their presence enhances other innovative activities. Interest in this topic is driven by the fact that in the United States, immigrants – in particular of East and South-East Asian origin – tend to be over-represented in science and engineering professions, among patent applicants, in start-up activities and among individuals who make important contributions in science and technology (cf. Wadhwa and Saxenian 2008; Breschi et al., 2014; Stephan and Levin, 2001).

Self-selection drives the majority of the migrant's innovative activities. Several theories suggest that immigrants are positively selected from their population of origin (Chiswick, 1999), while others suggest that this is only the case if the host country has a higher income inequality than the country of origin (Borjas, 1999a). Moreover, Hunt and Gauthier-Loiselle (2008) argue that skills in science and engineering tend to transfer better between countries than those required for other high-skilled professions. Science and engineering professions tend to have no complex licencing requirements and require less language and country-specific knowledge. Hence, individuals of this category might be more likely to move and to innovate.

The "cross-fertilisation" of immigrants with others also enhances innovative activities in the host countries. Boschma and Martin (2010) pointed out that "innovation is a production of interactions between actors that have sufficiently different knowledge". Referring to this, Rashidi and Pyka (2013) state that immigrants can foster innovation by bringing diversity into the workforce. Similar arguments of skill complementarity are advanced by Ottaviano and Peri (2005). However, diversity can also have negative effects by increasing transaction costs through communication barriers (Niebuhr, 2010), and can only have positive effects if diversity is associated with different but relevant information (Lazear, 2008).

Spill-over effects may occur both within companies and more broadly. Maré, Fabling and Stillman (2011), based on cross-sectional analysis of firm-level data from New Zealand, find no effect of the migrants in the workforce on firm-level innovation. Nathan and Lee (2013), using firm-level data from London, conclude that diversity at the management level was associated with increased firm-level innovation. More broadly, Hunt and Gauthier-Loiselle (2010) establish

that an increase in the share of skilled immigrants is associated with a positive impact on patenting in the United States, with a 1% increase in the share of immigrant college graduates being associated with a 9-12% increase in per capita patenting activity. Similarly, Niebuhr (2010) finds that diversity increased the number of patents based on German panel data. Finally, Chellaraj, Maskus and Mattoo (2008) show that foreign graduate students had positive effects on patenting based on time-series data from the United States, and Kerr and Lincoln (2010) come to the conclusion that higher availability of high-skilled work visa in the United States increased patenting activity among Chinese and Indian-born, but had little effect on native patenting.

There appear to be no specific empirical studies for developing countries. Since much of the existing evidence is based on countries in which the university system is also a strong draw to immigrants, the effect may be less pronounced elsewhere. Particularly in low-income countries, firm-level innovations that are determined through specific surveys may be a more useful benchmark of innovation than patenting activity.

The results of empirical studies on the overall impacts of immigration on productivity are mixed. Trax et al. (2012) estimate the effect of within-firm and local diversity on firm value added in Germany, and find a positive association with diversity but not with the size of the immigrant group. A one standard deviation increase in a plant's fractionalisation index is associated with a 10% increase in firm productivity. Mitaritonna et al. (2014) and Peri (2012) show that immigration had positive effect on productivity in France and the United States, respectively. In contrast, Ortega and Peri (2009) find no short-or long-term effect on total factor productivity; Ortega and Peri (2011) and Quispe-Agnoli and Zavodny (2002) even find negative effects. The effect depending on the economic sector is often unacknowledged. An exception is Paserman (2013), who finds no general positive effects of the migrant share in the firm on productivity based on panel data from Israeli manufacturing firms, but notes that there may be a positive effect in the high-tech sector.

Aggregate demand

Immigration can also affect GDP through its effect on the different components of aggregate demand – investment, consumption, government expenditure, and net exports.

The effects of immigration on government expenditure and on exports are elaborated in detail in the respective sections. Since prior empirical evidence suggests that as immigration is associated with higher increases in imports than exports, net exports might fall. For developing countries, the relationship may be the same. However, since there are mechanisms that could make the association between trade and migration stronger and others that could make it weaker in developing than in developed countries and since there is no specific empirical evidence, no certain conclusions can currently be arrived at.

A population increase likely increases the size of the governmental sector, although potentially less than proportionally. Certain models of political economy suggest that in very heterogeneous societies, social security systems and the provision of public goods will be smaller

than in more homogenous societies. Empirical evidence indicates that ethnic heterogeneity may have a stronger effect in this direction than heterogeneity in the country of origin. Overall, the effect is likely to be non-negative. For low and middle-income countries, there is no specific evidence. An expansion of the government sector may however be more difficult if the tax base expands only slightly due to large (un- or under-taxed) irregular sectors.

Investment demand will likely rise. First, the effect of immigration on investment through the channel of changed factor prices has already been discussed. To recapitulate, under a number of assumptions, when immigration increases the labour force, capital is diluted. This leads to higher returns to capital and hence higher investments until a new equilibrium is reached. Second, immigrants may enter the country not only as workers, but also as entrepreneurs who create investment demand (Nathan, 2014). For developing countries, no specific empirical evidence is available. There are reasons to believe that the effect of an increased investment demand may be less pronounced in some cases, as capital market imperfections might make it more difficult for companies to obtain capital.

Immigration also increases consumption demand, which can have ripple effects throughout the economy (Coppel et al., 2001). Of course, there is only an overall increase if the increase in consumption from migrants outweighs possible declines in consumption from native individuals experiencing decreasing labour income. Given the estimated magnitudes of such wage declines, it is likely that this condition is met, and some empirical results back this up. For example, Bodvarsson et al. (2008) raised per capita retail sales following the Mariel boatlift. Of course, the strength of this effect depends in part of how much of the immigrant income is spent within the country.

From a theoretical standpoint, Tapinos (1974) points out migrants with return migration intentions will have a higher savings and hence a lower consumption rate than native citizens. Similarly, Schaeffer (1995) argues that individuals who think they will have to return or those who have a greater cultural distance to the destination country's society will on average work and save more – and hence proportionally consume less – than those who think that they will stay or who have less cultural distance. However, empirical studies of the topic are scarce. For example, Nadadur (2009) cites a figure of 90% of undocumented US immigrant income being spent within the country. Moreover, Abizadeh and Ghalam (1994) find that all but immigrants who had arrived a long time ago in fact had a higher marginal propensity to consume out of wealth and out of their labour income than native families with household heads who had similar observable characteristics. In developing countries, the effect on immigration is likely the same as in developed countries. It may however be smaller if a larger percentage of immigrant income is remitted, for instance because a larger share stem from other developing countries.

To summarise, immigration may be associated with a fall in net export while the effects on consumption, investment demand and government expenditures are likely non-negative. Overall, immigration most likely increase aggregate demand. In fact, Mishan and Needleman (1966) argue that large-scale immigration would be associated with excess aggregate demand in the short run unless the marginal investment response to immigration is close to zero.

Overall effects - Empirical evidence

Much like the theoretical evidence, the empirical evidence on the impact of immigration on per capita GDP (growth) and productivity growth is mixed.

Based on a ten-region computable general equilibrium model that assumed perfect flexibility in labour and goods markets, Borgy et al. (2010) conclude that immigration would lower the per capita GDP of workers in immigrant-receiving regions. Based on panel data of 23 OECD countries, Dolado et al. (1994) also find that immigration negatively affects per capita GDP growth, but less so than other forms of population growth. In contrast, based on time-series data from the Netherlands and France, respectively, Muysken and Ziesemer (2011) and D'Albis et al. (2013) conclude that immigration is positively related to GDP per capita. Comparable results are found by Felbermayr et al. (2010) and Alesina et al. (2013) based on cross-sectional data from 162 and 195 countries, respectively.

Using time series data from Australia, Canada and the United States, Morley (2006) conclude that immigration did not cause GDP growth, and the same is concluded by Boubtane, Coulibaly and Rault (2013) based on a panel data analysis for 22 OECD countries. In contrast, Boubtane and Dumont (2013), using a systems generalised method of moments (GMM) estimator, find positive effects of immigration on per capita income growth for the same sample.

No generalisable conclusion can be drawn regarding which of the empirical estimates represents a more accurate measure of the "true" effect – in particular because the effect likely varies by country, time period and type of immigrant flow. For example, Orefice (2010) concludes that immigration has a negative effect on per capita GDP, but that high skilled immigration had a positive effect. Another example is that Kang and Kim (2012) find that immigration has no effect on growth, but that migrants from developed countries increase growth, particularly if they were migrating to less developed countries.

Past empirical research therefore provides no strong guide on which effects can be expected in different developing countries, and no direct empirical evidence is warranted.[7] Moreover, for both developed and developing countries, little is known on the impact of different types of immigration and on whether different growth impacts of immigration are associated with different immigration policy regimes such as point-driven systems versus systems based on lotteries or systems that primarily promote family reunification.

III.2. Exchange rate and current account

Further macroeconomic variables that may be affected by immigration are the exchange rate and the current account. Four principal mechanisms could explain an effect on the exchange rate:

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7 Martin (2007) provides estimates of immigrant contribution to overall Thai GDP. However, the estimate does not provide a counter-factual of how per-capita Thai GDP would have evolved in the absence of immigration.

differential changes in the import and export flows, technological progress, a disproportionate growth of demand for non-tradable goods and remittances flows.

The effect of immigration on the exchange rate

The first mechanism is a differential change in the import and export flows. Immigrants may bring a preference for products from their home countries, leading to rises in imports that are not associated with equal rises in exports. Theoretically, an increase in the trade deficit (or a reduction of the trade surplus) that would occur in this way could lead to a reduction on foreign reserves, which could lead to exchange rate depreciation.

The second mechanism is a faster rises in technological progress encouraged by immigration. This mechanism was proposed by Amuedo-Dorantes and Pozo (2004) in the context of remittances, but is based on the Balassa-Samuelson hypothesis. They argue that a productivity rise due to remittances would likely occur in the traded sector but raise wages in the non-traded sector as well, leading to an appreciation vis-à-vis the currencies of countries with a differential productivity growth. However, based on a European data, Froot and Rogoff (1991) find no evidence that relative increases in the productivity rate affect the exchange rate, while Chinn and Johnston (1996) found that an appreciation occurs.

The third mechanism is an immigration-caused expansion in the government sector tilted towards the non-traded sector, such as education or health-related services. This could lead to wage increases in that sector unless the labour supply for the sector is also expanded, or to an exchange rate appreciation (Amuedo-Dorantes and Pozo, 2004). Penati (1987) instead argues that while an expansion of government spending on the traded goods sector will always be followed by a depreciation and a rise in the current account surplus, an increase in the spending on the non-traded sector can lead to an appreciation; but that it can also have the opposite result. This could happen if production is "very elastic" and if aggregate private consumption increases. Empirical evidence by Balvers and Bergstrand (2002) shows that increases in government expenditures are associated with real exchange rate appreciations. In contrast, Ravn et al. (2007) find that unanticipated increases in government spending are associated with exchange rate deprecations and a deterioration of the trade balance.

Finally, remittance outflows could influence the exchange rate.[8] For example, Lopez et al. (2007) explain the mechanisms by which remittance inflows can lead to an appreciation of the real exchange rate. Among these is an increase of the net foreign asset position of the country, an increase in the demand for non-tradable goods, and through an effect on growth. It is not clear whether remittance outflows would have the opposite effects, with the exception of the lowering of the net foreign asset position. A rise in outward remittances as a result of increasing immigration would be unlikely to lead to a decrease in the demand for non-tradable goods, even if immigrants consume a smaller portion of their income. In contrast, a rise in remittances with a

[8] As for example discussed by Faini (1994), the exchange rate can also influence remittances. Consult Barajas et al. (2010) for a model that incorporates this feedback.

fixed number of immigrants would be associated with a decrease in demand, including in non-tradable goods, and could have devaluating effects. Empirical studies in this topic area also focus on the effect of remittance inflows rather than outflows (Amuedo-Dorantes and Pozo 2004; Lartey et al., 2012).

The effect of immigration on the current account

Regarding the current account, Mishan and Needleman (1966) argue that immigration will be associated with a negative effect on the balance of payment surplus. This is because remittances represent an accumulation of foreign liabilities, or formulated differently, an increase in the claims that foreigners have on domestic assets. However, Münz et al. (2012) note that remittances may be used to buy products from the country of destination, both because some of the increased demand in the country of origin cannot be met there and because there may be a demand for the technologies of the country of destination. Moreover, changes in the exchange rate that could occur through the mechanisms described above can also affect the current account, with depreciation typically being associated with an increase in the current account balance, while an appreciation would have the opposite effect. Finally, if immigration has a stronger effect on imports than on exports, this has a negative effect on the balance of payment.

In principle, these effects should not vary between developed and developing countries. However, one of the differences between the developed and developing countries is that many of the latter have pegged exchange rate. In this case, the mechanisms that operate through changes in the national price level should affect the real exchange rate in the same way as under a floating exchange rate regime.

III.3. Trade

Theoretical models suggest that depending on the drivers of trade, migration and trade can either be substitutes or complements. In contrast, empirical models almost universally find that there is a positive correlation between the two.

Trade and migration are substitutes in the endowment-based Hecksher-Ohlin model (Mundell, 1957) under the assumptions of identical technology and demand functions, constant returns to scales and perfect competition, and differences in factor endowments (Markusen, 1983). Under these conditions, either trade or migration will equalise the factor prices across countries. In practical terms, this could imply that an influx of workers of a previously scarce skills type results in products being produced in the destination country, which otherwise would have been imported (Poot and Strutt, 2010). More specifically, the increased number of immigrant workers could also affect the decision of domestic firms whether to out-source parts of their production process abroad. Such substitution between immigration and out-sourcing is discussed in a theoretical general-equilibrium model by Bandyopadhyay and Wall (2010). However, their model is static and does not take into account that per-capita capital levels may adjust in response to both immigration and out-sourcing. Moreover, this discussion is largely

irrelevant to developing and emerging economies, which for the most part are destinations rather than sources of out-sourcing.

Markusen (1983) shows that if the assumptions of the Hecksher-Ohlin model are relaxed, trade and migration need not be substitutes and can instead be complements – at least until one trading partner is completely specialised (see also Iranzo and Peri, 2009).[9]

In addition to acting as factors of production, immigrants can also influence trade flows in other ways. They can reduce unobserved trade costs, and create additional demand for foreign goods through their consumption and their effect on GDP.

First, immigration might affect unobserved trade-related transaction costs (Anderson, 2000). There are several possible mechanisms. Migrants may have insider information on goods companies and laws in their home countries. They may thus be able to identify and act upon trading opportunities and increase imports and/or exports (Tadesse and White, 2009). This knowledge may over time also spill over to non-migrants (Girma and Yu, 2002). Additionally, close-knit international migrant or ethnic networks can enforce contracts in situations of a weak institutional environments (Briant et al., 2009; Ehrhart et al., 2014). Rauch and Trindade (2002) give the example of ethnic Chinese networks, in which traders who break contracts or deliver sub-par goods are blacklisted in the entire network.

Second, immigrants might have preferences for home-produced goods (Trefler, 1995). This would increase imports of these goods – the so-called "transplant home bias" (Combes et al., 2005; White, 2007). Over time, native citizens may start appreciating these products as well, further increasing their imports Gould, 1994). Though not frequently discussed in this context, this effect may not be unidirectional, particularly if there is return migration. Migrants and their families may also develop preferences for goods produced in their host country. Hence, the preference effect can also increase exports.

Third, trade could rise if immigration increases overall income in the country of origin or the country of destination. Higher income is usually associated with higher levels of consumption, which increases demand for foreign and domestic goods and services (Poot and Strutt, 2010).

However, immigration may also have diverting effects on trade. Konecny (2007) suggests that when there are large immigration stocks from particular countries, trade with other countries may be diverted even if it had been beneficial because potential importers and exporters will go the path of least resistance and trade with the countries from which the immigrants are from, rather than to explore other options. Hence, immigration would still be

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9 Wong (1986) also analysed the same question in a general equilibrium framework, and showed different conditions under which factor mobility is a complement or substitute for trade. He however focuses on financial rather than human capital. Financial capital has the feature that its owners can remain in their country of origin while their capital is abroad, which is not true for the owners of human capital.

associated with increases in trade – but these increases might be smaller than what would have been observed in their absence.

Empirical studies on trade and immigration almost universally find positive associations, but often do not establish causality (Co et al., 2004; Collins et al., 1999; Dunlevy and Hutchinson, 1999; Felbermayr and Toubal, 2012; Gould, 1994; Herander and Saavedra, 2005; Lewer and Van den Berg, 2009; Mundra, 2005; White, 2007). The association tends to be stronger for imports than exports, which indicates that the preference channel plays a role. The correlation also tends to be more pronounced for heterogeneous than homogenous goods and for trading partners who are more culturally distant, both of which points to the importance of the information effect.

Some of the empirical studies use datasets that include developing countries (Hatzigeorgiou, 2010, Parsons, 2012). However, there is little research with a specific focus on developing countries. An exception is Hong and Santhapparaj (2006), who find that immigration to Malaysia is associated with higher imports and exports, particularly when the immigrants come from ASEAN countries. Since the positive relationship between migration and trade appears to be universal, it is unlikely to be fundamentally different in this context. In fact, unobserved transaction costs and hence the expected effect may be even higher. For example, Ehrhart et al. (2014) argue that immigrants can be a substitute for weak institutions when it comes to trade, and back this up empirically by showing that the pro-trade effects of immigration are larger for African countries than for others. There is anecdotal evidence from developing countries that some immigrants move to establish an import or export business (see for example Lyons, Brown and Li (2008) on African traders in Guangzhou), although the same is surely also true in developed countries. On the other hand, observed trade costs – for example due to an insufficient transport infrastructure and trade barriers – may be so important in certain regions that overall trade costs are still prohibitively high (Arvis et al., 2013). If this were the case, we would expect the effect to be smaller. Additionally, in many developing countries, immigrants primarily come from neighbouring countries. Given that the association between immigration and trade tends to be stronger when the country pairs are more culturally distant, this also suggests a smaller effect.

III.4. Prices

The theoretical predictions of whether immigration will lead to price increases depends on whether the demand or supply of goods is more strongly affected. Empirically, prices often fall in response to rising immigration, even for housing, though exceptions exist.

When assessing the price effects of immigration, we have to distinguish between traded and non-traded goods. In theory, unless the destination is the world's dominant producer, immigration does not affect the price of a traded good since the price is given by the world market. In contrast, the inflow of migrants could increase the prices of non-traded goods and services through the increase in demand (Neary, 1989). This will however only take place if the provision of these goods does not increase, if migrants and native citizens have homothetic preferences, i.e. the preference structure does not change, and if other factors do not influence the price dynamics of these goods.

One of such factors is the increased supply of labour and the possible decrease of input prices. The predictions of most models depend critically on the assumptions made with regard to the supply and labour markets effects of migration, namely the substitutability of migrant and native workers, the labour market structure (i.e. the labour intensity of the different sectors), and the characteristics of migrants. Since the effect of immigration on the final non-traded goods prices depends on the strength of each of these variables, it is a priori not possible to say whether the effect will be positive or negative.

There are a number of papers assessing the effect of migration on prices empirically. Lach (2007) employed monthly store-level data of more than 1 800 stores in 52 cities in Israel to analyse the effect of immigration on the prices of 915 traded final products. He finds that the inflow of migrants from the former Soviet Union has decreased prices significantly. His estimates show that a one percentage point increase in the ratio of migrants to native inhabitants reduces the prices for goods by 0.5 percentage points. The author provides evidence that the composition effect (the change in demand structure) of migration rather than its size effect (the increase in demand) drives these results. A proposed explanation for these empirical results is the higher price sensitivity of immigrants and the tendency of retailers to attract the new (price sensitive) consumers by reducing their mark-ups and hence lowering their prices.

Focusing primarily on non-traded goods, Cortes (2008) looks at the United States between 1980 and 2000. Her estimates suggest that a ten percentage point increase in the share of low-skilled migrants reduced the prices of non-traded goods in low-skilled labour intensive sectors by 2%. Using data for 14 cities in the US, Baghdadi and Jansen (2010) also find that immigrants have a negative impact on the prices of non-traded goods. Their results also suggest that temporary migrants have a stronger effect on prices than permanent migrants do, because temporary migrants are confined to work in the non-traded sector. The negative impact of migration on inflation is also documented for other countries. For example, Bentolila et al. (2008) provide an empirical analysis that suggests that inflation in Spain would have been 2.5 percentage points higher in the absence of migration.

Zachariadis (2012) approaches the question with a cross-country dataset. Using prices for 304 items in 90 countries between 1990 and 2006, they estimate that a ten percentage point increase in the share of migrant workers lowers the price of goods and services by around three percentage points. Their analysis shows that the price effect on products such as basic food items is much more pronounced than on services prone to employing migrant labour. They conclude that the demand-side effect seems to be outweighed by other factors, among them the supply side effect of increased labour supply and the resulting decrease in productions costs.

There is no reason to believe that the theoretical predictions regarding the relationship between migration and the movement of prices should not apply ceteris paribus for both developing and developed countries. Asymmetric changes between aggregate demand and aggregate supply will create an output gap that might result in inflationary pressures, whereas a decrease in the relative price of labour might decrease prices. The only study we are aware of that studies the effect of migration on prices in the context of developing countries was

conducted by Alix-Garcia and Saah (2010). The authors show that immigration to Tanzania from both Rwanda and Burundi between 1993 and 1994 entailed modest to strong increases of food prices. As these flows are mainly composed of refugees, the results might not be comparable to those of labour migration flows.

Effects on housing prices

One of the most important non-tradable goods is housing. First and foremost, this is because it is a basic need and, second, because it is a sector in which supply is rather inert. In the short run, it is plausible to assume that migration will have an effect on the housing market due to the increased demand. However, this might not be the case due to two mechanisms. First, as already discussed, prices might remain unaffected as the increase in labour supply also decreases the cost of construction. This could lead to a rapid adjustment of the housing market and even decrease the prices. Second, native inhabitants could relocate because of the inflow of migrants.

To approach this question empirically, Saiz (2003) used a natural experiment to study the effect of migration on metropolitan areas in the United States. He finds that the immigration of low-skilled workers only increased the rents of low quality units but left prices of high quality rental units unchanged. In contrast, relative housing prices decreased in the short run. Using a different dataset, Saiz (2007) estimates that a one percentage point increase in the population of a city due to migration increases the average rent by about one percentage point. Housing prices also increase, but only in the long run.

There are various studies that document the same mechanism for countries such as Spain (Gonzalez and Ortega, 2013), Italy (Kalantaryan, 2013), and New Zealand (Stillman and Maré, 2008). It is also notable that point estimates in most of these studies show a comparable magnitude. Moreover, the empirical literature has also identified a number of factors influencing this mechanism.

One important aspect is the reaction of native citizens. For example, Sa (2011) documents a negative impact of migration on local house prices. He attributes this finding primarily to the departure of the native population that reduces demand strongly and in turn decreases prices. This effect is more pronounced in locations where the immigrant population is characterised by low education. Various factors drive this segregation process.

First, the migration status itself does not drive the reaction of native inhabitants. Saiz and Wachter (2011) find that the residential demand of immigrants does not increase housing prices but rather slows down its growth based on using census tract data from the United States. These effects seem to be driven primarily by the demand for residential segregation based on education and ethnicity rather than on the country of origin of individuals.

Second, local amenities can also influence the search for housing. More precisely, immigrants value the existence of services that are catering to their specific languages, such as foreign schools or language oriented financial services. Fischer (2012) tests the hypothesis that a common language is the factor that mediates the effect of immigration on the housing market.

His analysis of Swiss house prices demonstrates that only an inflow of immigrants from non-common language countries has an impact whereas common language migrants seem to have no impact on house prices.

Similarly, Accetturo et al. (2014) argue that the change in housing prices they observe in 20 Italian cities is mainly due to the mobility of native citizens. Apart from the standard increase in housing demand effect, their model also assumes that the inflow of immigrants changes the perceived quality of neighbourhoods with respect to for example public amenities. This in turn results in native outflows from these neighbourhoods. Their empirical analysis suggest that a 10% increase in the immigrant population in a city district decreases housing prices by 2%.

Most of the studies undertaken suffer from two shortcomings. First, due to data limitations most studies are characterised by a high level of aggregation. Akbari and Aydede (2012) is an exception in this regard. The authors use a large dataset containing housing prices for 289 Census Divisions in Canada for 1996, 2001 and 2006. They find slightly negative effects on the prices of private dwellings in Canada. While they do identify statistically significant but negligible negative effects, they do not offer a plausible explanation of what is driving these effects.

Second, most of the studies focus on the demand side and only indirectly infer supply side effects. In an analysis of the Norwegian construction sector, Bratsberg and Raaum (2012) focus explicitly on the supply side. They demonstrate that any wage reductions due to increased labour market competition are passed on to final consumers. They suggest that a 10% increase in migration decreased the cost of construction in Norway in the range of 0.4-1.1%.

It was not possible to identify literature that investigates the relationship between immigration and the construction sector in developing countries in depth. However, one of the most prominent features of housing in developing countries is urban slums. These slums are not only marked by an observable high prevalence of low-quality housing but, more importantly, by tenure insecurity. The lack of property rights can have a wide array of possible effects affecting among others transferability, prices and investments. Although a summary of this topic is beyond the scope of this analysis, it is nevertheless important to touch upon two relevant aspects.

First, squatting could increase formal housing prices. Brueckner and Selod (2009) base their model on a common and fixed land area that is divided between squatters and formal renters. They also assume that squatters "rent" their land from the formal housing market. Too much demand for squatting decreases the availability of formal land and thus increases prices. In contrast, eviction of squatters brings formal market prices back down.

A second important side effect of tenure insecurity might also be that it can reduce labour supply. Field (2007) argues that squatters have to be physically present to avoid eviction – "defend" their dwelling. This reduces the time individuals can spend working. Based on data from Peru, the author shows that tenure insecurity reduced the labour supply of squatter households by 14 percentage points.

Finally, before undertaking any predictions on the effects of immigration on housing prices, it will be important to review existing housing policies and institutions. This is especially important for the elasticity of the supply of housing. As argued by Buckley and Kalarickal (2005), land is the binding constraint in many developing countries. Since the public sector still owns large amounts of land, no rapid expansion of (formal) housing can be expected.

IV. PUBLIC FINANCE AND PUBLIC GOODS

The last part of this review covers aspects related to public finance and public goods. The first part discusses financial impacts, focusing on tax payments, benefit usage and the overall fiscal impact. The second part discusses how the quality of public goods – both publicly provided goods and services as well as the environment – may be affected by immigration.

IV.1. Public finance

Taxes and social security contributions

The fiscal effects of immigration depend on a plethora of factors, such as the composition of the immigration flow, the rules of the welfare and tax system, the labour market, and the return propensity of immigrants. Given the multitude of these factors, theoretical predictions are not possible and the majority of studies on the fiscal impact of immigration are empirical.

Migrants may pay more or less taxes and social security contributions than natives because of different personal and labour market characteristics. Regarding the personal characteristics, children and retirees tend to pay few direct taxes, while working-age adults tend to be net contributors. Furthermore, immigrants may pay more or fewer taxes than their personal characteristics suggest depending on their integration into the labour market. For example, if they are unable to find a job, they would pay fewer direct and indirect taxes. Similarly, they might only find work in informal sector. Depending on the country's regulations, this could mean that they pay fewer (or no) income taxes and that the revenues that the business employing them generates are not taxed either. Indeed, countries with large informal sectors tend to have lower shares of income taxes in revenues (Besley and Persson, 2013). However, they still pay indirect (such as consumption) taxes, provided that the majority of their consumption does not occur on untaxed goods and services. Their indirect tax payments may also be lower if wage levels for comparable positions are lower in the informal than the formal sector.

Depending on regulations, it is also possible that immigrants pay the same tax levels or social security contributions as native citizen even though they are barred from benefitting from certain government services. For example, unauthorised immigrants in the United States, who often used a false social security number, cumulatively paid an estimated USD 120-240 billion into the social security system until 2007. This represents up to 10.7% of the Social Security trust fund (Schumacher-Matos, 2010). Since they are not able to claim any benefits in return, this amount is a net gain to the public purse.

Finally, immigrants can also impact the fiscal balance in the long run through their other effects on the economy. If, for example, immigration leads to reduced wages and boosts capital gains, this could deteriorate the fiscal situation if income tax rates are higher than capital return tax rates. On the other hand, if immigration boosts productivity and economic growth, this would increase overall tax returns not only from immigrants, but also from natives.

Of course, all characteristics mentioned in this enumeration may be influenced by governmental policy. Immigration policies as well as policies that affect the level of desirability of living in the country can shape the immigration flow; and labour market policies can influence the integration of immigrants into the (formal) labour market and into entrepreneurial ventures. Moreover, tax policy – such as the importance of indirect versus direct taxation, which tends to be higher in developing than developed countries (Burgess and Stern, 1993), and the progressivity of the tax system – affects how much a given immigrant population contributes to the system relative to its population size.

Financial impact of demand for public goods and social services

Inhabitants of a country generate various fiscal costs. These include costs to the government for building additional and maintaining existing infrastructure, providing public services such as hospitals, schools and policing, and paying transfer payments such as welfare, unemployment, pension, or family benefits.

Population increases of any form may increase some of these costs. For example, roads, streetlights and hospitals may be able to accommodate additional users, but beyond a certain threshold, new infrastructure may have to be built and fiscal costs would rise. Other categories of fiscal expenditures are for pure public goods such as national defence, whose supply and hence whose costs do not need to rise when the population grows.

As discussed in the context of tax payments, immigrants might have a different demand for public goods and services than native citizens for several reasons. These include different personal characteristics, different take-up rates of existing programmes and the creation of additional migrant-specific categories of expenditures. Finally, their presence may create spill-over effects that alter the native population's demand for public services.

The reasons why personal characteristics can affect demand for public goods and social services have already been discussed above. Working-age individuals integrated in the labour market usually have a lower demand for social services than younger or older and unemployed people do.

Moreover, immigrants may have take-up rates of government programmes that are lower or higher than for native citizens with comparable characteristics. This may happen because the legal or de-facto access to the programmes may be restricted, because immigrants may have more or less information about which programmes they are eligible for, and because cultural differences may influence the willingness to apply for benefits. The documentation status of an immigrant may have a strong influence in this area. Irregular immigrants often have fewer rights

to access governmental services, and even if the right exists on the books, they might be unwilling to exercise it out of fear of being identified and deported. For example, Schoevers et al. (2010) found that many irregular female immigrants in the Netherlands have unmet health care needs even though they have the right to access medically necessary care in most areas of care. They identified financial problems, refusals of services, lack of knowledge about their rights and a sense of shame as causes.

One common concern that immigration increases crime, which aside from crime's direct costs could lead to increases in policing and incarceration costs does not appear to be borne out by empirical evidence. Bell et al. (2013) determine that labour immigration from Eastern Europe was not associated with a rise in either property or violent crime in the United Kingdom. Similar results are obtained by Butcher and Piehl (1998), Reid et al. (2005), Ousey and Kubrin (2009), Stowell et al. (2009) and Wadsworth (2010) for the United States; and Bianchi, Buoanno and Pinotti (2012) for Italy. However, most of the studies do not present causal estimates, and the relationship between crime and immigration may differ from country to country. Therefore, an increase in fiscal costs through this channel is not outside the realm of possibility.

The immigrant status itself may generate additional fiscal costs. Examples are the costs of an immigration administration and registration system that may not be fully recouped by visa fees, detection and policing costs in countries with irregular migrants, and language classes.

The welfare system itself may skew the immigrant flow to a more unfavourable skill-mix (Kemnitz, 2003; LaLonde and Topel, 1994)[10], with feedback effects on the costs of the welfare system. Additionally, in federal systems, the location choices of immigrants may be skewed towards the most generous parts of the country (Borjas, 1999b). However, for immigration flows to be affected by the welfare system, potential migrants would first need to have knowledge of this system. Yet Leibfritz et al. (2003) cite a 2001 Eurostat survey in which migrants from Egypt, Ghana, Morocco, Senegal and Turkey were asked about their knowledge of labour market prospects and welfare systems prior to migration. Knowledge about the labour market was twice to five times as common as knowledge about the welfare systems, about which 10-25% of migrants were informed. Moreover, Giulietti et al. (2013) show that causal estimates of generosity of unemployment benefits in EU countries on immigration provide no evidence that there are "welfare magnet" effects. This is in line with empirical results by Pedersen et al. (2008) for OECD countries. In contrast, De Giorgi and Pellizzari (2009) find small but statistically significant effects of the welfare benefits on migration into countries of the pre-enlargement EU.

In most developing countries, it is unlikely that their welfare system exerts a strong draw on immigrants, in particular if non-citizens are excluded from any benefits that may be available to native citizens. As in developed countries, this exclusion may not only occur at the level of law-

[10] A number of models also explore the political economy of the link between migration policy and social security policy making in advanced economies. This literature is outside the scope of this review, but interested readers are for example referred to Scholten and Thum (1996), Haupt and Peters (1998), Razin et al. (2002), Krieger (2006), Lacomba and Lagos (2010), and Razin and Wahba (2011).

making: Landau and Kawbe-Segatti (2009) point out that even those immigrants that under South African law should have access to educational and health services, such as refugees, are excluded from using them. This exclusion stems either from constraints such as transportation costs or from their direct exclusion through officials. A similar observation is made by Carte (2014) based on ethnographic research on the access of Central American women to social services in the Southern Mexican state of Chiapas. However, other government services might exert a draw, which can lead to direct fiscal costs. For example, health care or school systems that are above average in the region may attract visitors as well as temporary or permanent immigrants, if access is not restricted. The degree to which this occurs does not appear to have been systematically analysed up to now.

Finally, the presence of migrants has broader effects. First, wage and other effects of immigration may alter the need of citizens to apply for public benefits. Second, Hanson (2008) points out that immigration may exacerbate inefficiencies in the public finance system. This could occur when an influx of people leads to an increase in the size of the government and, as a result, an increase in inefficiencies found in the public sector.

The question of whether immigrants receive more or less support than native citizens through welfare and other direct transfers is so contentious and central to the policy debate that much of the empirical literature on the fiscal impact of immigration focuses solely on this aspect. Examples include Blau (1984), Gustafsson (1986), Tienda and Jensen (1986), Borjas and Trejo (1990), Baker and Benjamin (1995), Borjas and Hilton (1996), Riphahn et al. (2013), Hammarstedt (2000), Hansen and Lofstrom (2003), Pellizzari (2011), Sarvimäki (2011), Barrett and Maître (2013), Drinkwater and Robinson (2013), and OECD (2013). Barrett and McCarthy (2009) provide an overview. These studies deliver mixed results, with either a lower or a higher welfare dependence of immigrants in different developed economies. Moreover, some find that welfare participation increases over time while others find that immigrants assimilate out of welfare. Controlling for personal characteristics of immigrants decreases the gap in the amount of transfers that immigrants and native citizens receive. The above-mentioned empirical studies rarely take into account the financial costs of the demand of immigrant families for non-welfare public goods such as health and education services. Studies that address the overall fiscal impact of immigration often encompass these other public goods. Their results are presented in the next part.

Overall fiscal impact

Studies of the fiscal impact of immigration measure the effect either through calculating the annual contributions and usage of the system by immigrants, or through estimating the net present value of these flows over the lifetime (potentially including descendants of immigrants or the possibility of return migration). This difference is far from a technicality, since the two types of estimates measure two fundamentally different concepts. More recent research has gravitated towards measuring the lifetime fiscal impact of immigrants, and for good reason. While most labour immigrants are of working age, annual estimates will over-state the fiscal benefits of immigrants who will after all age and potentially become transfer recipients.

Moreover, a key question for many developed countries –whether immigration can help finance the destination country's pension system – can only be answered using this longitudinal perspective.

In the context of developing countries, two considerations nonetheless make the use of annual measures useful as well. First, most of these countries have less developed social security systems. Later-in-life fiscal costs are hence a less important consideration. Second, while most developed countries' governments face few constraints in their ability to borrow, this is not necessarily the case for developing countries. Hence, the question whether immigrants are currently net fiscal contributors or not is more relevant.

Depending on the political and administrative structures in the destination countries, it is possible that costs are borne disproportionally by different levels of government. For example, it is possible that immigrants reduce the per-capita costs of the federal government's public good provision if it provides defence and other non-congestible services, while state, regional or local governments may bear rising costs due to an increased demand for medical and educational services (Lee and Miller, 2000). This appears to be the case in the United States. A 1997 study by Clune found that while immigrant household in California paid more in taxes and contributions to the federal government than they imposed in benefits and other costs, they had a negative fiscal impact on their local and particularly state government (Smith and Edmonston, 1997). Similar findings are presented by Wadensjö (2007) for immigrants to Denmark from non-Western countries.

For developed countries with ageing societies, it has been argued that immigration may allow them to maintain the sustainability of their pension and overall tax systems (Storesletten, 2000). However, the full effects of population ageing will not be able to be reversed even through significantly higher levels of immigration (Coleman, 2002; Fehr et al., 2004). For most developing countries, this debate is not yet of a high importance as their fertility rates are still higher and their old-age pension systems less developed. Nevertheless, for a few emerging countries, such as China, it will gain in relevance quickly.

As discussed above, there is no expectation that estimates on the fiscal effects of immigration in different countries would yield similar results. Indeed, the effects are disparate: looking at the current fiscal impact, Dustmann and Frattini (2013) conclude that non-European Economic Area (EEA) immigrants imposed a negative fiscal burden of around GBP 104 billion (Pound sterling) over 1995, but that EEA immigrants contributed around GBP 9 billion. Similarly, Wadensjö (2007) shows that non-Western immigrants have a net fiscal impact of around DKK 41 000 (Danish krone) and Western immigrants a positive one of DKK 49 000. This impact is more positive than the net fiscal impact of around DKK 35 000 among native citizens without an immigrant parent. In a simulation model, Storesletten concludes that in Sweden, the average new immigrant imposes a fiscal burden of approximately USD 20 000 over his or her lifetime. Lee and Miller's (2000) net present value calculation suggests that the fiscal impact of an immigration flow of 100 000 per year to the United States is initially negative, but turns and remains positive after 2030 as the children of these immigrants start to enter the labour force. Based on

generational accounting methods, Auerbach and Oreopolous (1999) find that if immigration in the United States were halted after 2000, the fiscal burden faced by future generations would rise around 3.5-3.9%, provided that fiscal balance is not already achieved by the current generation. Similarly, Chojnicki (2011) estimates that a halt to new immigration as of 2005 would mean that in order to reach a fiscal balance while keeping benefits constant, the lifetime tax burden on new-borns would have to be raised by 14.5% versus 14.2% under a continuing migration scenario. More drastically, for Spain, Collado et al. (2004) indicate that the fiscal burden on future generations would have to rise by 16% more in a scenario of zero new immigration versus an annual immigration flow of 60 000.

Despite these seemingly different results, in a recent review of the literature for OECD countries, the OECD (2013) found that while some estimated positive and some negative, they tend to be smaller than 0.5% of GDP and are, on average, zero. Rowthorn (2009) argues that the small effects are the result of a combination of having immigrants that contribute a lot on the one hand and that cost a lot on the other hand.

Comparable reviews do not appear to exist for developing countries. Given that results from OECD countries are unlikely to extrapolate, this is a major gap in the literature. Ideally, forthcoming studies would moreover distinguish by the legal migration status. For both developed and developing countries, it would furthermore be of interest to analyse whether different immigration policy regimes are associated with different fiscal impacts.

IV.2. Public goods

Government-provided goods

Immigration may not only affect the costs of providing public goods and services, but also their quality.

When the public good is pure – that is, non-rival and non-excludable – immigration does not affect its quality. If replacement investments are necessary, immigration could benefit native citizens because immigrants can contribute to these future costs (Leiner, 1997). The same is true if there are scale economies in the provision of non-pure public goods and the pre-immigration population is below the level at which they can be most efficiently provided.

If the publicly provided good is rival, the increase in demand that is associated with immigration can create congestion. This is not only true for non-excludable goods, but also for excludable goods from whose use society is politically unable or unwilling to exclude immigrants. One example is schooling for immigrant children. Another example is the United Kingdom's unwillingness to bar any resident from the free use of the National Health Service (House of Commons Library, 2008).

The time and quality losses of congestion can have real economic costs in terms of for example the economic value of time lost when people are in traffic jams or wait for the doctor and decreases in the education and health of the population due to overcrowded schools and

hospitals. Congestion can of course be averted if the provision of the good is expanded. Native citizens may have to disproportionally pay for this expansion if immigrants are predominantly unskilled and pay fewer taxes (Chao et al., 2013). The costs of expansion may rise more or less than proportionally (Carruthers and Ulfarsson, 2003).

It is however conceivable that it is impossible to expand the provision of the public good, either for political reasons or because it is technically infeasible. There is a substantial literature on the effect of diversity on the size of (local) government, although much of it is defined in terms of ethnic backgrounds rather than countries of birth. For example, Alesina et al. (1999) show that the share of spending on "productive" public goods such as roads, sewers, and education is lower in US cities when ethnic heterogeneity is higher. A similar result is found by Easterly and Levine (1997), who demonstrate that countries with higher ethnolinguistic diversity have worse school attainment and fewer phone lines. For Western Kenya, Miguel and Gugerty (2005) also show that funding for primary schools and water wells is negatively related to ethnic diversity. However, it needs to be noted that in a recent meta-analysis, Schaeffer (2013) finds that unlike other diversity measures, diversity in country of origin is not negatively associated with measures of public goods provision and social cohesion. Finally, expansion may not always be possible because a key input may temporarily not be expandable. For example, public school teachers typically require several years of training. An unexpected surge in family immigration could place stress on the school system that can only be met by expanding class size if all teachers are already fully occupied.

The effects of immigration on the quality of public goods can vary by the legal status of the immigrant. On the one hand, regular and irregular migrants may demand certain goods, such as roads, equally. If the legal status of immigrants affects its own tax revenues or its tax allocations from the central government – for example because only legal immigrants count when funds are allocated – governments may be less able to respond to congestion caused by irregular than by regular immigrants. On the other hand, irregular immigrants might not access certain services, either because they are forbidden from using them, or because they fear that if they did, they would be detected by the authorities. If this is the case, then irregular immigrants should create less congestion than regular immigrants.

Despite the high public interest, there is little empirical research on the effects of immigration on congestion and on the quality of public good delivery. The inconclusive results on the effect on educational attainments have already been discussed in the section on human capital. On other public goods and services, there is usually only anecdotal evidence. For example, Robinson (2007) recounts complaints by local authorities and police forces in the United Kingdom that they were not able to maintain their usual level of service due to large immigration flows in the wake of the 2004 EU enlargement. Focusing on housing, he shows that immigrants from accession countries account for less than one percent of new social housing tenants and thus only have a small impact on the availability of social housing for native citizens.

The need for further empirical research is particularly true for developing countries, in which congestion problems and a general under-provision of key public services is already

endemic even in the absence of substantial immigration flows. It seems intuitive that countries with a larger economic resource base to draw on should be able to adjust more flexibly to increased demands for public goods and services than countries where large parts of the native population are still un- or underserved. However, an empirical confirmation of this conjecture is still outstanding.

Environment

Immigrants may also affect the environment of their host country, with potential consequences for the health and well-being of the population and ramifications for the long-term production potential of the country.

The question of whether immigrants positively or negatively affect the environment can be split up in two parts: First, how does population growth per se alter the environment, and second, do immigrants have a larger or smaller impact than a native person?

Kraly (1995) states that there are three principal perspectives on the effect of population on the environment. The first is of Neo-Malthusians, who believe that population growth deteriorates the environment (Ehrlich and Holdren, 1971). A second category sees the potential for population growth to enhance innovations that reduce environmental impacts (Simon, 1990). A third perspective is that population growth initially leads to negative effects, but that these encourage further innovation (Boserup, 1981), although possibly only if the right governmental policies are in place (Pender, 1998).

Based on a literature review, Robinson and Srinivasan (1997) state that there is little evidence that population growth is associated with scarcity in exhaustible resources. Nevertheless, they also cite the 1992 World Development Report that states that resources that have market prices, such as oil, metals and minerals, are not subject to scarcity while resources such as water and clean air that do not have such prices are being affected.

Robinson and Srinivasan (1997) also argue that the interactions between environmental problems and population growth are different in developing than in developed countries, and missing property rights for local resources might be a reason why. However, they also point out that poverty may be the underlying causal variable for both rapid population growth and environmental deterioration. Empirically, Cropper and Griffiths (1994) find that when per capita income is held constant, local population density is associated with increased deforestation in Africa. For Latin America and Asia, the effects are not statistically significant. In an overview of the literature concerning the effects of demographic changes on land quality in hill and mountain regions of developing countries, Templeton and Scherr (1999) conclude that local population growth is often associated with initial increases in tree loss, erosion and degradation and a decrease in agricultural productivity. They however also find that this process tends to be reversed after a while, and speculate that increases in land prices, which lead to technical and technological change, are behind this development. This would imply that at least in this context, missing property rights are not an issue.

The second important question is whether immigrants have a larger environmental impact than a native – that is, whether they are "exceptional resource degraders" (Codjoe and Bilsborrow, 2011). The potential effects of immigration on aggregate consumption and technological change have already been discussed. In many cases, immigrants will have a lower income level and a higher savings rate than the native population. This implies that they consume less and hence potentially generate less environmental harm. Moreover, immigrants may be supportive of innovation, which depending on its nature might benefit or harm the environment. Additionally, immigrants might specifically move to shift the agricultural frontier outwards. They may also engage in more environmentally destructive farming methods because they have no long-term link to the land, are poorer or have less knowledge about locally appropriate farming methods (Codjoe and Bilsborrow, 2011). Finally, it is possible that immigration has negative effects on societal institutions, indirectly affecting environmental protection (Cassels et al., 2005).

Empirically, Squalli (2010) finds no association between the concentration of immigrants in a US state and several different types of emissions. While a larger population is associated with higher emissions, states with higher immigration have lower NO2 and SO2 emissions and no differences in CO and PM10 emissions. The authors attribute the less pronounced environmental impact of immigrants compared to natives to their lower consumption. Codjoe and Bilsborrow (2011) find that migrant households in Ghana were not more likely than native ones to extend the farmland that they are using. However, they let their land lie fallow for less time than natives farmers did. Cassels et al. (2005) determine that immigrants in Indonesia are more likely to live in villages with low environmental quality, but that they are not more likely to use destructive fishing techniques and that their higher likelihood of a higher fishing effort is related to working on large fishing boats instead of in the subsistence sector.

V. CONCLUSION

A 2011 online poll by Ipsos revealed that the majority (52%, to be precise) of respondents in 23 predominantly high-income countries believed that there were too many immigrants in their country (Gottfried, 2012). Other surveys reveal similar attitudes (cf. OECD, 2011b). As has been noted elsewhere, these views are at odds with the majority of positive views of international trade. They are also at odds with many of the theoretical and empirical results on the economic effects of immigration on the destination country, which often find positive effects:

- *Labour markets:* Empirical studies in the context of developed countries tend to show limited average wage effects yet negative effects for certain population groups, such as low-income workers and prior immigrant cohorts, may experience some negative effects. These results are consistent with theoretical models with imperfect substitutability and a heterogeneous workforce, with native mobility, or with adjustments in the production technology or the product mix.

- Many of the potential adjustment responses are still insufficiently explored, especially in developing and emerging economies. The labour market effects may differ between developing and developed countries because of different strengths of labour market segmentation, different degrees of substitutability between native and immigrant workers and different adjustment capacities. In countries with strong labour market segmentation, immigrants may only directly compete with native workers of certain sectors. However, this may be counter-balanced if immigrants are not perceived as 'different' from native citizens. Finally, certain features (including less developed capital markets, less openness towards international trade and limited employment growth) may reduce the speed at which the economy can adjust to an immigrant inflow.

- *Entrepreneurship and self-employment:* In many countries, self-employment rates are more elevated among immigrants than among native workers. Several theories have been advanced to account for this phenomenon, including the migrants' personal characteristics, labour market discrimination and ethnic enclaves. In developing countries, limited evidence points to the fact that immigrants may be more frequently self-employed as well. Little is known about whether there are positive spill-over effects to the entrepreneurship of native citizens in these countries.

- *Human capital:* The human capital effects of immigration, which consist both of the human capital that immigrants bring with them and native adjustments, are theoretically and empirically ambiguous. The evidence for developing countries is

sparse; and (tacit) knowledge transfer as a mechanism for human capital gains through immigration remains an under-researched topic.

- *Prices:* Due to the fact that immigrants act both as consumers and factor input suppliers, they affect both the demand for and the supply of goods. Therefore, theoretical predictions about the price effects of immigrations are ambiguous. Most empirical studies find that higher immigration is associated with lower prices. Surprisingly, this appears to be the case even for housing, a good for which the supply one of the key inputs – land – is inelastic. For developing countries, little empirical evidence exists so far, but one study found rising prices due to a refugee inflows. It may be hypothesised that production adjusts more rapidly and that the percentage of traded goods is higher in developed than in developing countries. This would entail that immigration would be more likely to be inflationary in the latter than in the former. It is also possible that housing prices or the extent of squatter dwellings rises as a reaction to increased large-scale immigration due to a high prevalence of tenure insecurity and imperfect construction sectors in many developing countries.

- *Exchange rate:* From a theoretical perspective, immigration may have effects that could lead to both appreciation and depreciation of the exchange rate. These mechanisms include an increase in remittances outflows, an increase in productivity that varies between sectors, an expansion of governmental expenditures tilted more towards traded or non-traded goods, and a change in the proportion of imports and exports. The same mechanisms can affect the current account and therefore, the overall expected effect is likewise ambiguous. Empirical studies in this area were rarely identified.

- *Trade:* Depending on the drivers behind trade, immigration and trade are either complements or substitutes. Empirical evidence however almost universally suggests that immigration is associated with higher levels of trade, and that imports increase more than exports. Possible explanations are that immigration reduces unobserved trade costs, that immigrants prefer goods from their home country, and that immigration-induced increases in GDP translate to higher trade levels. Little is known about the effects in developing countries specifically. Unobserved trade costs may be particularly high, suggesting that the effect may be large and positive. However, if observed costs such as transportation and tariffs are prohibitively expensive, the reduction of unobserved trade costs may have little impact.

- *Productivity and GDP:* Immigration can affect per capita GDP and GDP growth through aggregate supply and aggregate demand effects. Immigration can also boost productivity and technological change. The possible mechanisms behind this include increasing worker specialisation and productivity-enhancing characteristics of immigrant workers, such as high flexibility, high entrepreneurial drive, prior technological knowledge that is not yet common in the destination country, and a

favourable age structure. The empirical evidence on the growth effects of immigration is mixed. In contrast, its association with various forms of innovation tends to be positive. More causal studies are needed on the GDP and innovation impacts of immigration. For developing countries, it is possible that the temporary reduction in per capita GDP that follows a labour market inflow and the associated capital dilution will last longer as capital may be more difficult to obtain and as market rigidities make a reallocation of the product mix more difficult. However, the empirical evidence on the effects on growth and innovation is largely missing.

- *Public finance and public goods:* Immigrants may pay more or less taxes and access welfare and other government-provided transfers and programmes more or less than the average native citizen. Possible reasons are different labour characteristics and, legal provisions that prevent immigrants from accessing certain services and benefits and different take-up propensities for governmental programmes. Theory provides no general a priori predictions, and empirical results are mixed. Immigration may also affect the quality of public goods, including pure public goods if immigration allows more (re-)investment and impure public goods if they become congested, and of the environment. On the former, there is hardly any empirical evidence, and on the latter, the evidence is mixed.

  Even less is known on the fiscal and public good quality impacts of immigration in developing countries. It is likely that potential congestion effects might be more difficult to solve than in high-income countries, due to a higher difficulty of mobilising additional government funds.

In addition to the topic-specific questions already raised, a few cross-cutting research questions merit additional research attention.

First, and most pressing from the point of view of this particular review, is the need for additional theoretical and empirical research on the specific effects in developing countries. The few studies that exist almost exclusively focus on labour market impact and thus leave out many other important effects. There are reasons to believe that adjustment processes may work differently in high-, middle- and low-income countries, but empirical proof is outstanding. Future research should cover a broader array of developing countries, investigate a more comprehensive list of economic outcomes and ideally identify the mechanisms through which heterogeneous impacts may come about.

Second, empirical studies on impact of immigration frequently assume linearity. However, it is conceivable that there may for instance be threshold effects. For example, a country's school system may easily be able to integrate the children of immigrants if the flow remains below a certain level, but above that level, further investments would be required if the quality of instruction is to remain constant. Similarly, while studies sometimes distinguish between regular and irregular or skilled and unskilled immigrants, further heterogeneities among the immigration populations are rarely taken into account.

Third, the analysis of immigration's economic impact cannot and should not take place in a "policy vacuum". Whenever possible, theoretical but particularly empirical research should strive to understand how different immigration and integration policy regimes influence the direction and strengths of the impacts. Many important questions in this area are still unanswered. For example, do countries that aim to select their labour immigrants based on a point system reap more positive effects than countries that favour family reunification migration? How do outcomes compare for countries that implicitly allow large irregular immigration flows compared to countries that primarily have legal immigrants? Moreover, how do implicit and explicit integration policies influence the effects? Improvements in migration data and in the coding of immigration and integration policies may make answering such questions more feasible.

This review suggests that few cross-country analyses have been done with the aim of developing a better picture of the effect of immigration in developing countries. It has provided critiques and perspectives on the existing literature as well as insights that can point to further research, including for the project, "Assessing the economic contribution of labour migration in developing countries as countries of destination". More precisely, this project will assist in filling the research gap in developing countries, as pointed out in this review. Such research will help to identify certain population groups that are affected by immigration, to call for compensatory schemes for such groups, or to maximise the benefits of immigration through tackling barriers to adjusting immigration flows.

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