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MIGRATION, JOBS AND WAGES: REASSESSING BENEFITS AND CHALLENGES OF LABOUR MIGRATION

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Executive Summary

As ASEAN Member States (AMSs) move up the economic ladder through the burgeoning ASEAN Economic Community (AEC),[1] there are concerns whether labour should be among the facets to be fully integrated, as suggested in a recent World Bank Report.[2] For instance, one survey shows that for developed and developing AMSs where data was available, majority of locals showed concerns of job insecurity amid the presence of immigrants.[3]

On one hand, labour migration offers benefits, especially in countries with shrinking working age population, against labour shortage. This is relevant to the region, as most AMSs are expected to see declining population growth in the next 50 years.[4] However, the convergence of labour markets among countries at different levels of economic development can also *reduce welfare* of locals, who face the risk of more job competition and falling wages.

In theory, wages may fall temporarily, in the short-term, but eventually increase in the long-term. [5] We have found that there are indeed countries where labour migration was associated with rising wages. We then compared these with countries where labour migration was associated with falling wages (over a 10-year period), to see what the former had done differently. Our comparisons show that wages increase amid labour migration in countries with more targeted institutional support to allow domestic firms to be internationally competitive, focusing on indicators that affect the ease of doing business, e.g. access to credit, ease of trade, and start-up costs; better infrastructure for transport and communication, and more investment in

[1] Ong Keng Yong, Asean Moves Forward To Build a Single Market, Wall Street Journal, accessed 4 April 2018, https://www.wsj.com/articles/SB106565297916480700.
[2] Mauro Testaverde, Harry Moroz, Claire H. Hollweg, and Achim Schmillen, Migrating to opportunity: overcoming barriers to labor mobility in Southeast Asia, The World Bank, 2017, accessed 6 December 2017, https://openknowledge.worldbank.org/bitstream/handle/10986/28342/211106ov.pdf?sequence=19.
[3] 'Online Data Analysis', World Values Survey, 2017, accessed 6 December 2017, http://www.worldvaluessurvey.org/WVSOnline.jsp
[4] Dwintha Maya Kartika, How can ASEAN be relevant for future labour mobility?, in Mari Elka Pangetsu $ Rastam Mohd Isa (eds.), ASEAN future forward: Anticipating the next 50 years, Kuala Lumpur: Institute of Strategic and International Studies (ISIS) Malaysia, 2017.
[5] Elise S. Brezis & Paul Krugman, Immigration, investment and real wages, NBER Working Papers 4563, National Bureau of Economic Research, Inc., 1993, accessed 1 February 2018, http://www.nber.org/papers/w4563.pdf.

research, education, and healthcare; and international competitiveness in medium- and high-technology industries, to capture export markets in high-income countries.

Overall, a more nuanced appreciation of labour migration is needed. Labour migration by itself is neither boon nor bane, as its impacts hinge on the kind of support provided by countries in the recommended focus areas above. Apart from these, we have also identified further lines of inquiry, to deal with the complex implications of labour migration moving forward.

Introduction

In an interconnected world, the subject of migration often evokes mixed reactions. As states work toward ensuring their economic security and prosperity against an increasingly competitive global environment, labour migration has become an important issue that requires careful consideration in development policies. But labour migration is no longer just about economics. Its impact cuts across the socio-political and security concerns of states and societies, in both developed and developing economies.

In Southeast Asia, labour migration is an integral component of regional economic integration. The ASEAN economic community (AEC) has envisioned a single market and production base for ASEAN.[6] Its 2025 AEC Blueprint has further outlined measures toward achieving 'a networked, competitive, innovative, and highly integrated and contestable ASEAN'.[7] Although in theory, a single, integrated market allows for free movement of labour, ASEAN member states' policies on labour migration are highly circumscribed. As most states in ASEAN are developing economies, there are understandably concerns that free movement of people would affect employment and wages of migrant destination countries in the region. Suffice it to say, however, that deliberations on how to deal with demands and pressures of labour migration will remain an important agenda for regional economic integration in Southeast Asia.

In spite of the concerns of freer movements of people, there are a number studies that examine the benefits of labour migration in ASEAN. A recent report published by the World Bank, entitled '*Migrating to opportunity: overcoming barriers to labour mobility in Southeast Asia*,' has shown that there are net positive impacts of migration on receiving countries, amid increasing intra-regional trade integration in ASEAN.[8] The basis for the projected positive impacts of easing migration in the

[6] 'Single Market and Production Base', ASEAN, 2018, accessed 18 March 2018, http://investasean.asean.org/index.php/page/view/asean-economic-community/view/670/newsid/758/single-market-and-production-base.html.
[7] ASEAN Economic Community Blueprint 2025, ASEAN, Jakarta: ASEAN Secretariat, 2015, accessed 18 March 2018, http://www.asean.org/storage/2016/03/AECBP_2025r_FINAL.pdf.
[8] Mauro Testaverde, Harry Moroz, Claire H. Hollweg, and Achim Schmillen, Migrating to opportunity:

aforementioned World Bank report is that trade integration brings about changes in prices of commodities.[9] The prices of some commodities decline as a result of the trade-shock of opening up to foreign competition, and these reduce wages of workers in sectors where those commodities are produced. These affected industries are likely those which had hitherto been protected from foreign competition, and include those which are less internationally competitive. While the common worker's response is to shift to other sectors where wages are higher, labour migration barriers prevent this from happening. As a result, workers suffer more when there are higher barriers to labour migration. As such, in a scenario where commodity markets become better integrated, workers' welfare can be improved if barriers to labour migration are removed, providing a net benefit in welfare among workers, in comparison to the scenario where there are barriers to labour migration. The findings of the World Bank report are significant in that they provide new perspectives on the contentious issue of migration and wages by linking labour migration with another consideration, namely, a scenario of a sudden removal of barriers to international competition, or a sudden increase in trade integration.

Against this background, this NTS Report aims to add to the study on the benefits of labour migration, by going beyond the context of intra-regional trade and regional integration, and exploring other structural factors or conditions which allow for migration to have positive impact on wages in receiving countries. This Report, in particular, examines the linkage between labour migration and wages and analyses how the competitiveness of business firms/companies, and the conduciveness of country-level conditions to firm competitiveness, allow for a positive impact of migration on wages. Specifically, we want to examine whether having more competitive firms and providing a conducive business environment to boosting firm competitiveness, allow for wage increases in labour receiving countries, under an open migration policy.

Overcoming barriers to labor mobility in Southeast Asia, The World Bank, 2017, accessed 6 December 2017, https://openknowledge.worldbank.org/bitstream/handle/10986/28342/211106ov.pdf?sequence=19.

[9] 'Online Appendices for Moving to Opportunity', accessed 18 March 2018, https://openknowledge.worldbank.org/bitstream/handle/10986/28342/211106app.pdf?sequence=2&isAllowed=y.

In addressing these questions, we do not attempt here to deal with the other important facets of labour migration (i.e. their impact of societal cohesion, culture and identity and political stability) while mindful that these issues are indeed very important. The narrow scope of this paper is but an attempt to take a slice of the many debates and complexities of migration and flesh out a particular part of the puzzle. In doing so, we aim to provide another perspective on the current thinking on labour migration with the view to inform policies on this important but contentious subject.

Before proceeding further, we also want to note that the analyses provided in this Report are preliminary. Nonetheless we hope that the issues raised here can be taken up in future research.

Revisiting tensions between migration and wages

Jobs and wages are among the most contentious concerns debated and researched today in relation to the economic impacts of labour migration.[10]

When individuals are employed and earn higher wages, they can afford better education, healthcare and housing—factors which are commonly used to measure quality of life and well-being.[11] As economies open up and become more integrated, and as there are freer movements of goods, services, and labour, there are growing concerns that local jobs are being taken by foreign workers, robbing locals of the ability to earn the needed wages,[12] which could have helped improve their quality of life. This is relevant too because, as a recent OECD study shows, unstable labour conditions throughout one's working life contribute to inequality in later stages in life, i.e. when aging.[13]

[10] Amelie F. Constant, Do migrants take the jobs of native workers? IZA World of Labor 2014: 10 doi: 10.15185/izawol.10.
[11] 'OECD Better Life Index', OECD, 2017, accessed 16 January 2018, http://www.oecdbetterlifeindex.org/#/11111111111.
[12] Dwintha Maya Kartika, How can ASEAN be relevant for future labour mobility?, in Mari Elka Pangetsu $ Rastam Mohd Isa (eds.), ASEAN future forward: Anticipating the next 50 years, Kuala Lumpur: Institute of Strategic and International Studies (ISIS) Malaysia, 2017.
[13] OECD, Preventing ageing unequally, Paris: OECD Publishing, 2017, accessed 31 January 2018, http://dx.doi.org/10.1787/9789264279087-en.

Repercussions of migration on domestic labour markets are salient concerns especially among developed countries which become attractive destinations given that they can pay higher wages than less developed countries. In the United Kingdom, for instance, a report by the Bank of England shows that a 10% increase in migration in a specific sector (semi/unskilled services) led to a close to 2% decline in wages;[14] in the United States, a 10% increase in migration was found to lead to a 3%-4% decline in wages among competing workers.[15]

On the other hand, there is a positive take on migration when one looks at the envisioned single market and production base as part of the ASEAN Economic Community. In theory, an integrated labour market allows workers to earn higher incomes, and also allows sending countries access to more remittances which form part of their GDP. [16] It also makes up for shortfalls in workers, especially among countries where populations are aging or falling. In ASEAN, the rate of population growth across all member states is expected to slow down heading up to 2065 (in the next half-century), at which point growth rates start to become negative in Thailand (-0.67%), Singapore (-0.32%), Myanmar (-0.15%), Brunei (-0.15%), Vietnam (-0.07%), Indonesia (-0.01%) and Lao People's Democratic Republic (Lao PDR, -0.01%), signalling that international labour markets will become an even more relevant means of ensuring that economies will have sufficient workers to meet their industries' requirements.[17, 18]

In spite of the potential benefits of labour migration, many people in AMSs, developed and developing alike, see migrants as potential job competitors and to

[14] Stephen Nickell and Jumana Saleheen, The impact of immigration on occupational wages: Evidence from Britain, Staff Working Paper No. 574, London: Bank of England, 2015, accessed 28 January 2018, https://www.bankofengland.co.uk/-/media/boe/files/working-paper/2015/the-impact-of-immigration-on-occupational-wages-evidence-from-britain.pdf?la=en&hash=16F94BC8B55F06967E1F36249E90ECE9B597BA9C.

[15] George J. Borjas, The labor demand curve is downward sloping: Reexamining the impact of immigration on the labor market,' Quarterly Journal of Economics 118(4): 1335-1374, November 2003

[16] Dwintha Maya Kartika, How can ASEAN be relevant for future labour mobility?, in Mari Elka Pangetsu $ Rastam Mohd Isa (eds.), ASEAN future forward: Anticipating the next 50 years, Kuala Lumpur: Institute of Strategic and International Studies (ISIS) Malaysia, 2017.

[17] Ibid.

[18] While falling, growth rates were still projected to be positive for the Philippines (0.46%), Cambodia (0.25%) and Malaysia (0.18%). Source: Dwintha Maya Kartika, How can ASEAN be relevant for future labour mobility?, in Mari Elka Pangetsu $ Rastam Mohd Isa (eds.), ASEAN future forward: Anticipating the next 50 years, Kuala Lumpur: Institute of Strategic and International Studies (ISIS) Malaysia, 2017.

some extent, as threats. Data from the World Values Survey (quoted in a recent report by the World Bank) shows that for the six countries where data was available (Malaysia, Thailand, Vietnam, Singapore, Indonesia and the Philippines), majority of locals felt that 'employers should prioritize people of (their) country over immigrants when jobs are scarce.' [19] , [20] Thailand, in fact, has 39 occupations where migrants are banned from competing with locals (e.g. engineering, accounting, and architecture), in spite of mutual recognition agreements the country has already signed.[21] Another instance is when, despite a decline in the total number of employed workers, the situation was still seen as a positive development, a 'reason for cheer as more locals find jobs'.[22,23]

Diverging impact of migration on wages across countries

Today, the ASEAN region faces a quandary, on how to move forward to reap the benefits of greater labour market integration, while at the same time ensuring that domestic populations are protected against the potential backlash from having more foreigners compete with locals for jobs.

Perhaps one reason why it is still not clear if migration brings net positive or negative impacts on wages is that there have been diverging experiences in this regard. In fact, we found that the world views are split, rather close to the middle, between countries where wages and migration tend to move together, where we say that the countries have gained in wages from increasing migration, and countries which have lost in wages, i.e. where wages and migration move opposite ways.

Figures 1 and 2 below show the relationship between migration and wages from 2005 to 2015, based on a comparison of 182 countries where data was available. Figure 1 shows 98 countries (54%) which have gained from migration, i.e. a

[19] 'Online Data Analysis', World Values Survey, 2017, accessed 6 December 2017, http://www.worldvaluessurvey.org/WVSOnline.jsp
[20] Mauro Testaverde, Harry Moroz, Claire H. Hollweg, and Achim Schmillen, Migrating to opportunity: Overcoming barriers to labor mobility in Southeast Asia, The World Bank, 2017, accessed 6 December 2017, https://openknowledge.worldbank.org/bitstream/handle/10986/28342/211106ov.pdf?sequence=19.
[21] Ibid.
[22] Joanna Seow, Reason for cheer as more locals find jobs, The Straits Times, 27 January 2018, accessed 28 January 2018, http://www.straitstimes.com/singapore/manpower/reason-for-cheer-as-more-locals-find-jobs.
[23] Nurhuda Syed, Employment at its lowest in almost 15 years, says MOM, Human Resources Director Asia, 26 January 2018, accessed 28 January 2018, https://www.hrdmag.com.sg/breaking-news/employment-at-its-lowest-in-almost-15-years-says-mom-245979.aspx.

percentage increase (decrease) in the share of migrants out of the total population (x-axis) from 2005 to 2015 was associated with a percentage increase (decrease) in average wage rates, over the same period, as measured by the GDP per employed person in 2011 PPP dollars (y-axis). In contrast, Figure 2 shows 84 countries (46%) which have lost from migration, where migration had a negative effect on wages, i.e. a percentage increase (decrease) in migration is associated with a percentage decrease (increase) in wages.

Figure 1

Countries where there is a positive relationship between migration and average wages

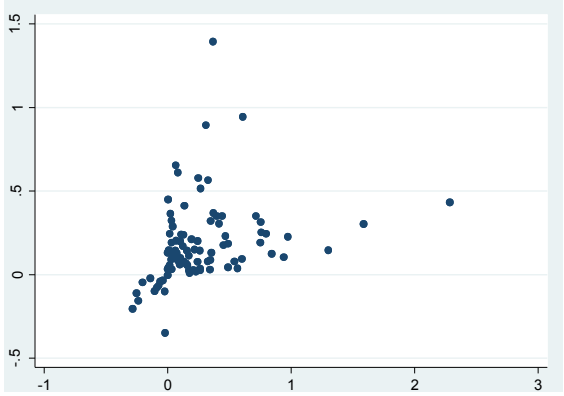
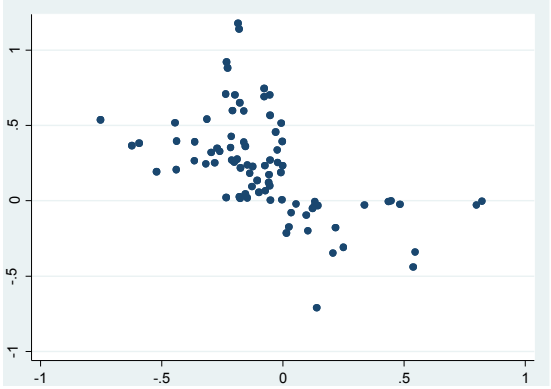


Figure 2

Countries where there is a negative relationship between migration and average wages

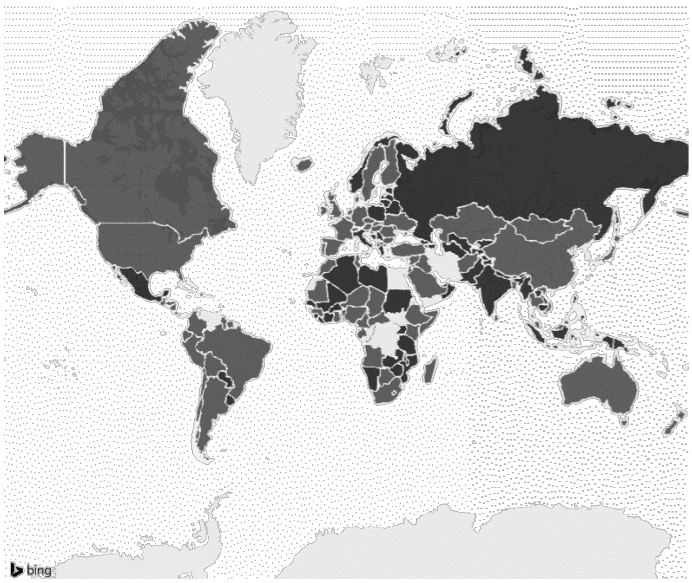


Notes: **X-axis:** % increase in share of migrants; **Y-axis**: % increase in average wages (GDP per employed person, constant 2011 PPP); **Scale**: A value of '1' equals 100%

Source: Authors based on data from World Development Indicators, 2017

Figure 3, below, shows the countries which have lost in wages from migration **(dark shade)**; countries which have gained from migration **(light shade**) on a world map. For further detail, Tables 1 and 2 in Appendix 1 contain the full list of countries that countries that gain and countries that lose. (For an explanation for why we chose GDP per employed person in 2011 PPP dollars, please refer to Appendix 2.)

Figure 3: Countries where migration (% share of migrants) has a positive relationship with GDP per employed person (constant 2011 PPP) from 2005 to 2015 (light shade).



Legend: Dark shade = countries which have lost in wages from migration; **Light shade** = countries which have gained in wages from migration; **No shade** = Data is unavailable

Source: Map was created using the 3D Maps Feature of MS Office (Excel), as an alternate way of presenting the data in Figures 1 and 2.

It would be tempting to say that because there are more countries who have gained than have lost from migration, countries should be more open to it. But this would not be helpful in policy-making, as the odds of wages increasing or decreasing are rather close to 1:1 (or a 50-50 split).[24] One will find, in fact, that across ASEAN, five countries belong to the group that have gained in wages (Brunei, Malaysia, Singapore, Thailand and Vietnam) and five countries to those that have lost (Cambodia, Indonesia, Lao PDR, Myanmar and the Philippines).

We therefore explore why countries diverge in wage outcomes from migration. Doing so would allow us to reconcile differing views on the impacts of migration on wages, and understand under what conditions migration has negative impacts on receiving countries. This may, in turn, show the way forward on how governments may bring

[24] As indicated in the previous paragraph, 54% (98 countries) saw wages having a positive relationship with migration, while 46% (84 countries) saw wages having a negative relationship with migration, from 2005-2015. This 54%-46% split is our basis for saying that there is close to a 50-50 split.

together the seemingly conflicting objectives of having more workers to support one's industry, while ensuring that locals do not lose out on jobs or wages.

How labour migration affect jobs and wages

We start by analysing the bases for the negative attitude that locals have about migration, and on how it affects jobs and wages. We look at the motivations of foreign workers to migrate, the incentives of employers, and the impact on local workers.

Key actors and interests

Individuals shift jobs in order to receive higher wages.[25] Immigrants, in this sense, migrate to earn more (net of the cost of living in the host country), for as long as what they get is higher than what they would have earned in their own home countries. The crux, of why immigrants migrate at all, lies in the differences in wages between the countries of origin and the host countries. Figure 4 shows how wages vary across AMSs, as measured by GDP per employed person, which standardizes wages in dollar terms across countries and adjusts for purchasing power parity (PPP) to ensure that inflation is taken into account (in 2011 PPP$).[26] By this indicator, one can see that Singapore's average wage affords workers in Singapore 8 times what the average wage of workers in the Philippines' can afford them, 14 times that of Myanmar's, and 22 times that of Cambodia's.[27] Brunei, Malaysia, and Thailand follow, and together with Singapore, make up the top four countries that hold 97% of the intra-ASEAN migrant stock.[28]

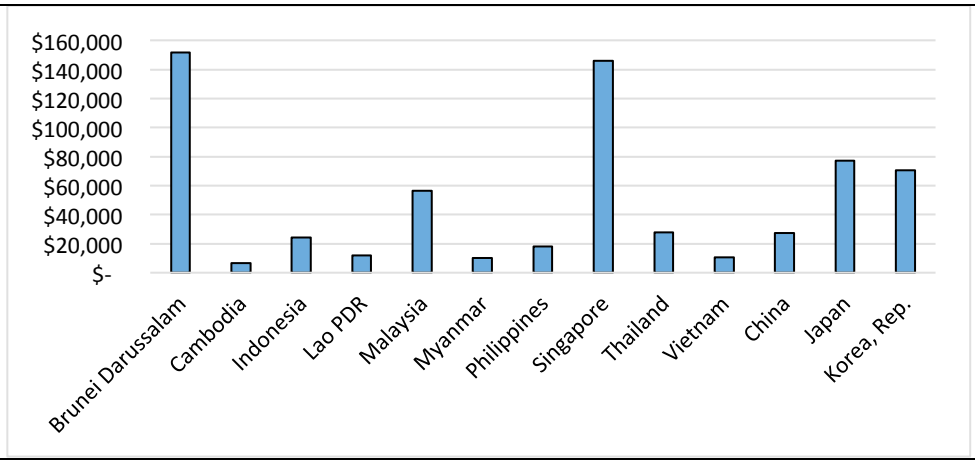
[25] George G. Borjas, Labour Economics, 5th Edition. Singapore: McGraw Hill. 2010.

[26] Definition: 'Purchasing power parity conversion factor is the number of units of a country's currency required to buy the same amounts of goods and services in the domestic market as U.S. dollar would buy in the United States. This conversion factor is for GDP. Historical estimates are provided for the 2005 benchmark year only. A separate series is available for extrapolated estimates based on the latest ICP round.' Source: 'World Development Indicators', World Bank, 2017, accessed 16 January 2018, https://data.worldbank.org/.

[27] 'World Development Indicators', World Bank, 2017, accessed 16 January 2018, https://data.worldbank.org/.

[28] United Nations (UN), Trends in international migrant stock: The 2015 revision, United Nations database, New York: UN, 2015. POP/DB/MIG/Stock/Rev.2015.

Figure 4: Annual GDP per person employed (constant 2011 PPP $) in ASEAN+3, 2016



Source: Authors based on 'World Development Indicators', The World Bank, 2017, accessed 16 January 2018, https://data.worldbank.org/.

On the other hand, companies or employers in host countries, with their goal of maximizing their profitability, will set a wage rate that allows them to minimize costs for every unit of output they produce. Given the wage differences highlighted above, employers in more developed countries, which have the capacity to pay higher wages than employers in less developed countries, have a basically limitless demand for jobs from among similarly-skilled workers from less developed countries. Anyone from any approved sending country can apply for the same job, alongside local applicants in the host country. For instance, amid the surge in the working population, there are more youth today than jobs are available for them,[29] such that globally, only 40% of people aged 15-24 are employed.[30] The labour market then is to some extent within the control of firms in host countries, who can choose who to employ on the basis of how each applicant can help the company meet its bottom line (profits) faster.

Finally, locals will take jobs for as long as the wage level allows them to meet their own living requirements, to pay for housing, education, healthcare, and other factors that allow for good/better quality of life. While an open migration policy provides a symbiotic relationship between immigrants from less developed countries and

[29] UN, Unemployment to remain high, quality jobs harder to find in 2018 – UN labour agency, UN News Centre, 22 January 2018, accessed 23 January 2018, http://www.un.org/apps/news/story.asp?NewsID=58457#.Wmbd_66WaM8.

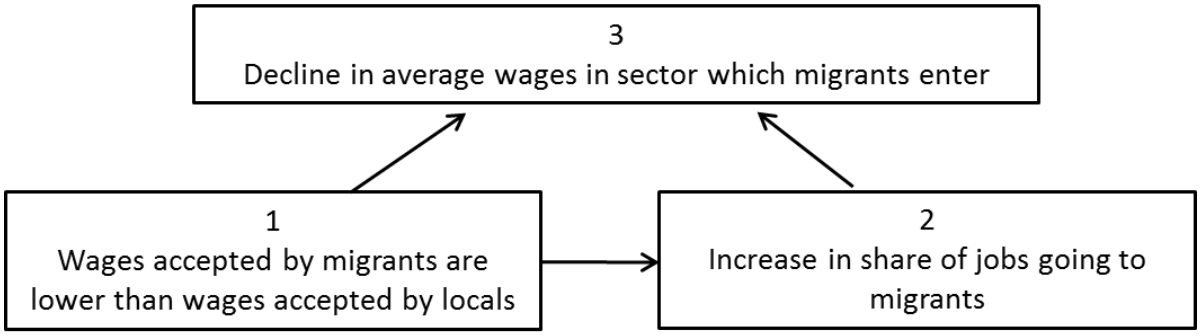
[30] 'Employment to population ratio, ages 15-24, total (%) (modeled ILO estimate)', World Bank, 2017, accessed 28 January 2018, https://data.worldbank.org/indicator/SL.EMP.1524.SP.ZS.

employers in developed countries, this can leave locals jobless or with lower wages, as the next section will show.

Dynamics of how migration dampens wages, given interests of actors

We now explain how the interests of actors, explicated above, can lead to negative employment and wage outcomes in sectors which migrants enter.

Figure 5: Dynamics of how wages decline in sectors where migrants enter



Source: Authors

First, when, given equal levels of skills/education/experience, immigrants are willing to settle for lower wages (Box 1), the outcome is that locals lose to foreigners in the job application process (Box 2). Immigrants from less developed sending countries face lower costs of living in their countries of origin, compared to locals in more developed host countries. For instance, the Cost of Living Index by the Economist Intelligence Unit, which compares the cost of living in different cities with New York, shows that as of September 2016, the cost of living in Singapore was 20% more than in New York, whereas costs in Bangkok (Thailand) and Hanoi (Vietnam) were between 70% and 80% of New York's, and costs in Phnom Penh (Cambodia), Ho Chi Minh (Vietnam), Jakarta (Indonesia), Manila (the Philippines), and Kuala Lumpur (Malaysia) were between 60% and 70% of New York's.[31] For this reason, wage thresholds of immigrants from lower cost countries will be lower than locals in more developed host countries. Given equal skill levels, the outcome is that immigrants from lower cost countries become more attractive to hire, from the employer's viewpoint.

[31] Data Team, The Economist, 'Measuring the cost of living worldwide', The Economist, 21 March 2017, accessed 18 January 2018, https://www.economist.com/blogs/graphicdetail/2017/03/daily-chart-13.

The next impact, apart from locals losing out to foreigners, is that average wages could decline in the particular sectors where migrants enter. Assuming migrants can out-compete locals by bidding down the wage they are willing to accept, employers in that particular sector are able to economize by hiring equally-skilled workers at lower wages. The result is that the average wage of that sector becomes lower than what it would have been had there not been any migrants. By simple arithmetic deduction, the larger the share of jobs going to migrants employed at lower wages, the bigger is their potential impact in lowering the average wages in the sector which they enter (Box 3). At the general level, this leads to a bigger impact of migrants' wage rates on the average wage rate of the country.

For instance, it has been observed that in Malaysia, a 10% increase in immigrants led to a 1% decline in wages for those who have completed primary school, and an approximately 0.25% decline overall, given that more low-wage migrants competed with locals in these sectors. [32] In Thailand, estimates show that a doubling in the size of immigrant workers is associated with a 0.79% decline in income for those with upper primary education as their highest level of education.[33] Given that there are migrant workers that are employed in these countries for tasks that demand less skill, it is understandable that sectors which employ those with primary education or less are the same sectors where an increase in migrants led to a reduction in wages (in contrast, those with secondary and tertiary education saw wages increase in both countries).

The net effect of the dynamics above is that as migrants increase, average wages for locals will fall. This can increase the level of discontent by the locals, when wages fall below the lowest wage rate which locals can tolerate, to pay for amenities such as education, health care, and housing for their families, given the higher standards of living they need to cover. Beyond a certain point in wages, locals may not even be interested in applying for these jobs.[34] In fact, it may come to a point when locals will start posting on social networks about negative impressions they have about

[32] Mauro Testaverde, Harry Moroz, Claire H. Hollweg, and Achim Schmillen, Migrating to opportunity: Overcoming barriers to labor mobility in Southeast Asia, The World Bank, 2017, p.106, accessed 6 December 2017, https://openknowledge.worldbank.org/bitstream/handle/10986/28342/211106ov.pdf?sequence=19.
[33] Ibid.
[34] We make a note here that impacts above would occur in the absence of minimum wage restrictions and worker quotas. We return to these policies later in this paper, in recommendations for further study.

migrants, or start showing signs of repugnance towards foreigners who 'steal' their jobs. If governments in host countries respond reactively to local sentiment, and end up treating migration as a non-traditional security issue that impacts the welfare of their citizenry,[35] then these governments may start to create or increase barriers to staying/working in their countries.

Re-assessing the impact of migration on jobs and wages

The previous section on how migration can have a negative impact on jobs and wages, is however an incomplete picture. This is because there are countries that have seen wages increasing alongside positive net migration, as shown earlier (Figure 1). In this section, we re-assess the relationship between jobs and wages.

Following the insight that these impacts depend on other factors, as was assumed in the World Bank report cited earlier,[36] we similarly expand the analysis of factors influencing average wages in the host countries. Here, we explore why some countries lose in wages, and why some gain in wages, from migration.

How migration possibly impacts wages

In a working paper by Brezis and Krugman, they argued using economic and mathematical intuition, that while immigration may have negative impacts on wages in the short-run, they may also contribute to an increase in wages in the long-run.[37]

In the short-run, if the total number of workers increases faster than the amount of capital (such as tools and machinery), this results in a lower amount of capital for each worker. This reduces the average productivity or value-add per worker, and causes wages to go down. But in the long-run, capital may change. Firms which are more profitable are able to accumulate more capital to expand their production.

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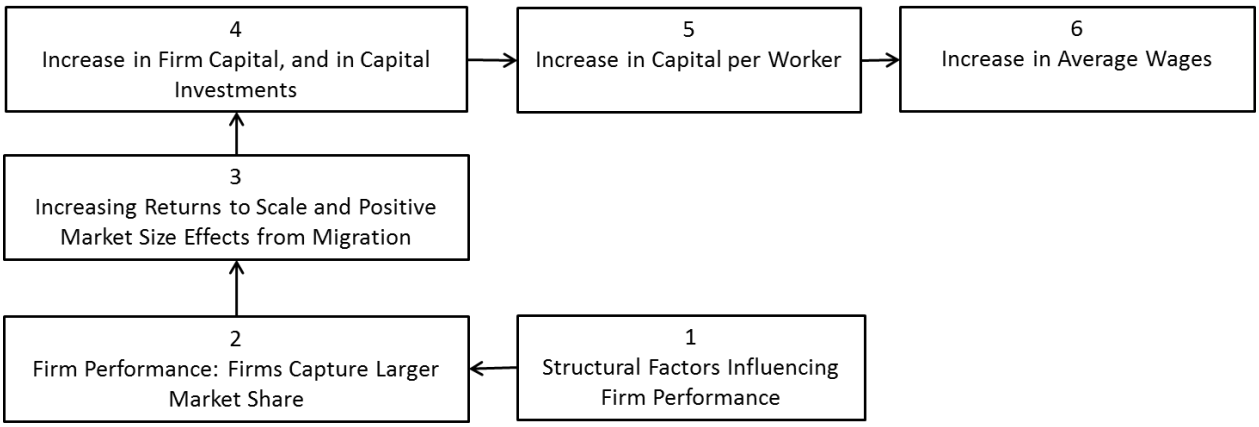
[35] Mely Caballero-Anthony, Understanding non-traditional security, In Mely Caballero-Anthony (Ed.), *An Introduction to Non-Traditional Security Studies: A Transnational Approach*, London: Sage Publishing, 2016. https://uk.sagepub.com/en-gb/asi/an-introduction-to-non-traditional-security-studies/book242757#contents

[36] Mauro Testaverde, Harry Moroz, Claire H. Hollweg, and Achim Schmillen, Migrating to opportunity: Overcoming barriers to labor mobility in Southeast Asia, The World Bank, 2017, p.106, accessed 6 December 2017, https://openknowledge.worldbank.org/bitstream/handle/10986/28342/211106ov.pdf?sequence=19.

[37] Elise S. Brezis & Paul Krugman, Immigration, investment and real wages, NBER Working Papers 4563, National Bureau of Economic Research, Inc., 1993, accessed 1 February 2018, http://www.nber.org/papers/w4563.pdf.

Figure 6: How an increase in migration can lead to higher wages, depending on firm performance



Source: Authors, based on Brezis and Krugman[38]

Brezis and Krugman assert that *if* domestic firms are competitive and successful in capturing a large share of both international and local markets (Box 2),[39] and assuming that part of that output is produced using goods which are sourced locally, it is possible to have a scenario of increasing returns to scale and positive market-size effects (Box 3): these mean that an increase in market size (such as from increases in labour migrants) translates to an increase in revenues and profitability of firms, and in turn, greater accumulation of capital. For firms to expand their production to continue to meet demand for their products, they will then increase investments (Box 4). This leads to an increase in the amount of capital which each worker can use (Box 5), and in turn, an increase in productivity, value-add, and wages (Box 6).

However, the outcomes theorized by Brezis and Krugman will only occur **if** firms are competitive. The problem is, firm performance tends to vary. Earlier analysis by the World Bank on ASEAN enterprises, using survey data from the International Finance Corporation (IFC), showed that growth performance of companies, as measured by

[38] Elise S. Brezis & Paul Krugman, Immigration, investment and real wages, NBER Working Papers 4563, National Bureau of Economic Research, Inc., 1993, accessed 1 February 2018, http://www.nber.org/papers/w4563.pdf.

[39] They frame it as a scenario of monopolistic competition. While one interpretation of monopolistic competition is to see it as a result of market barriers that leads firms to capture a large share of the market, it can also be interpreted as firms becoming sufficiently differentiated and specialized, as a result of superior performance, that allows them to capture a large share of the market.

sales growth, differs based on the country the firms is located, the sector it competes in, and the size of the firm. [40] Over a 3-year period, average sales growth across firms varied from 5% per annum or p.a. (Myanmar's SMEs) to 363% p.a. (Vietnam's SMEs). Across sectors and within countries, performance varies too. Sales in Vietnam's manufacturing sector grew by 182% p.a., while its retail services sector grew by 29% p.a. and other services sectors grew 31% p.a., significantly higher than Myanmar's sector growth of 9% p.a., 7% p.a. and 9% p.a. in manufacturing, retail services and other services, respectively. Firms experiencing positive sales growth will desire to draw more workers to increase their production and meet growing demand; in the process, they may even provide higher wages in order to entice more workers, and better-skilled ones at that, to migrate.

In contrast, in industries where firms perform poorly, the increasing returns to scale and positive market size effects described by Brezis and Krugman, may not happen. Instead, firms doing poorly can take the easy way out to maintain profitability and stay afloat by either cutting down on workers, reducing wages, or both, e.g. by replacing more expensive local workers with cheaper foreign workers. From this perspective, the performance of firms and industries is an important mediating factor that influences whether additional migrants will lead to increases in wages. It follows, too, that countries with better structural factors (Box 1) which allow firms to become more competitive, will be more likely to gain than lose in wages amid an increase in migrants.

Evidence of positive gains: Structural factors

In light of the two hypothesized factors, namely, the performance of firms (Box 2) as well as the presence of favourable structural conditions that allow for positive firm performance (Box 1), we conducted comparisons of the countries which gain in wages from migration, and those that lose in wages, to test the impact of said factors.

[40] Andrew Beath, Yumeka Hirano, Jose Ma Luis Montesclaros, Bridging the development gap : ASEAN equitable development monitor 2014 (English). Washington, DC: The World Bank Group, 2014, accessed 17 January 2018, http://documents.worldbank.org/curated/en/352061468232750667/Bridging-the-development-gap-ASEAN-equitable-development-monitor-2014.

The methodology and data source for our comparisons are described briefly in Appendix 3. As that provides a rather technical explanation, we describe our methodology here, in layman's terms.

Basically, we assess if over a relatively long time period of 10 years, countries that had superior firm performance as well as better structural factors which enable competitive firm performance, were those where migration and wages both moved in the same direction, whereas countries which had worse firm performance and worse structural factors, were those where migration and wages moved in opposite directions. (We used data in both the initial year, 2005, and the final year, 2015). However, even if for a particular indicator, those belonging to the group that gained from migration had better performance, on average, than those that lost from migration, we still run the risk that the difference could only be a random difference, or by chance. To avoid this, we considered the differences within the groups as well. The statistical test described in Appendix 3 allowed us to eliminate variables which turned out to be only random differences, and to retain those which differed significantly between both groups.

In these sections, we only display the results for variables wherein those that gained in wages because of migration had significantly better performance in comparison to those that lost from migration.

We find that indeed, countries that gain from migration are those which had better structural factors that provide a more conducive environment for businesses. (For further detail, please refer to Appendix 4, which shows all of the factors found to be significantly different between those that gained, and those that lost, from migration). These factors are:

1. **Ease of Doing Business:** First, we find that in countries that gain from migration the ease of doing business indicators are better, as their overall 'distance to frontier score' (0=lowest performance, 100=frontier) was higher (62.6) in comparison to those countries that lose in wages from migration. (58.3).
2. **Credit Registries:** Countries that gain have better credit registries that allow for better coverage of individuals or firms, provide better information such as

repayment history, unpaid debts, and credit outstanding (refer to 'Private credit bureau coverage' and 'Public credit registry coverage' in Appendix 4).

3. **Trade Requirements:** Countries that gain also required fewer documents to import and export, and spent almost 34% less time (24 hours less) for border compliance for exporting.
4. **Transparency:** In countries that from migration, as much as 44% and 45% of firms give informal payments to public officials, and give gifts in meetings with tax officials, as part of their business practice; in contrast, in countries that gain, only pay 28% and 25% give informal payments and gifts to respective officials.
5. **Access to Credit**: Firms need funding to innovate; however, not all firms may be able to access this credit, especially if the loan requirements are not friendly to them. We find that in countries that gain, more than a third of firms (34.1%) are expected to use banks to finance their working capital, while only 26.2% of firms, among countries that lose, access these funds.
6. **Start-up Requirements**: Individuals desiring to start businesses and enter lucrative sectors may face hurdles in starting up their business, and we found that barriers were consistently greater among countries that gain than countries that lose. The cost of business start-up procedures, as a share of the gross national income per capita, was approximately 42% among countries that gain from migration, and 69% among countries that lose, implying higher costs in the latter.[41] Furthermore, the time required to start a business was an average of approximately 30 days among countries that gain, and approximately 42% among countries that lose. Last, while businesses pay different types of taxes, businesses in countries that gain are expected to pay a smaller number of taxes (counted by type of tax) than countries that lose.

Apart from those factors which directly influence businesses, we also find that other important structural factors such as infrastructure and human capital, are important.

[41] The differences for these three indicators were significant but only at the 10% level of significance (90% level of confidence).

Countries that gain from migration performed better in these factors than, countries that lost in wages from migration, elaborated on below.

7. **Transport**: Overall, countries that gain from migration had better port infrastructure quality, with a score of 4.2, than countries that lose (3.7). On average, and in spite of varying sizes of countries, countries that gain had 3.8 times more registered air transport carrier departures, and more than double the number of passengers carried. They likewise had an average score of 29.3 in the Liner shipping connectivity index, whereas countries that lose had an average score of 17.2 (although both are still far from the maximum score, of 100 in 2004). Last, countries that gain had more than double (141%) port traffic, or the flow of containers from land to sea transport modes (and vice versa), which is indicative of the greater trade which is facilitated by infrastructure.
8. **Communication**: We also found that on a per capita basis, countries that gain had an average of 20.7 telephone subscriptions (per 100 people), 10.3 fixed broadband subscriptions (per 100 people), and approximately 279.8 secure internet servers (per 1 million population), while countries that lose only had 14.7 telephone subscriptions (per 100 people), 6.3 broadband subscriptions (per 100 people), and 108.1 secure internet servers (per 1 million people). Last, in terms of total individuals using the internet, also known as internet penetration, the average percentage among countries that gain was 38.2%, while the score was only 27.8% among countries that lose.
9. **Research and Education:** We found that expenditures on education as a whole, especially in secondary education, were also significantly larger among countries that gain than among countries that lose. In this regard, countries that gain had a larger share of their populations enrolled in pre-primary, secondary, and tertiary enrolment (while primary school enrolment was not significantly different); a larger share holding post graduate degrees; and almost double the number of researchers in R&D as a share of their population (1.4 thousand per million people in countries that lose, 2.7 thousand in countries that gain).

10. **Health:** Governments among countries that gain spent a larger share of their public expenditures on health; moreover, on a per capita basis, countries that gain spent double ($1,100) what countries that lose spent ($589) in constant 2011 international dollars (PPP).

Evidence of positive gains: Better firm performance

As a result of better structural conditions, as shown above, we found that firm performance was also significantly better in countries that saw wages increasing, given migration, than those that saw wages falling.

The indicators we use to measure firm and industry performance fall under the broad category of international sales (exports). Given the variations in the products, we do not measure the total market share of a country, as each economy will have its own mix of sectors, with its own configuration of interrelationships among sectors feeding to each other's competitiveness. The bottom line would be the net total impact of migrants on a nation's economy, jobs and wages, taking this complexity into account.

1. **Total Exports**: We found that on average, exports of goods and services were larger among countries that gain than among countries that lose. Countries that gain have 2.37 times more commercial service exports than countries that lose, and up to 2.32 times more merchandise exports.

We also found that particular segments of exports were important.

2. **Technology and Value-Addition in Exports**: Countries that gain from migration have 7.6 times more high-technology exports than countries that lose. We interpret this as high-technology exports, being higher in value-add as they are higher up the value-chain, providing greater profits for firms. Moreover, as a share of overall exports, countries that gain had a larger share of their total manufactured exports coming from medium and high-technology exports (29% more). Moreover, countries that gain had a larger share of total exports being in the form of exports which were manufactured (26% more), rather than just raw materials (e.g. ores/iron/fuel).

3. **Export Destinations:** Last, we found that within the segment of high-technology exports, countries that gain were able to seal more deals with higher income countries, implying even greater profitability. Countries that gain had 12% larger shares of their merchandise exports to high-income economies in comparison to countries that lose, who had more of their exports to low- and middle-income countries.

As a result of better performance, and consistent with the arguments by Brezis and Krugman, market capitalization or the value of all listed shares in domestic companies, was more than three times (319%) larger among those that gained, than among those that lost. This implies a larger amount of capital, that can in turn be used to support a larger number of workers. It guards against reductions in value-add per worker, and workers' wages, and instead, provides the opportunity for value-add/wages to increase.

In light of the finding that high-technology exports were important, we also compared human capital in both groups, in terms of the ability of locals and migrants to produce concrete innovative ideas, as measured by industrial design applications, patents, and trademark applications. We found that locals and migrants in countries which gained in wages amid migration produced significantly more industrial design applications, patent applications, and trademark applications.

4. **Innovation capacity of workers:** We found that residents among countries that gain had 2,463% more industrial design applications compared to residents in countries that lose,[42] 1,784% more patent applications, 226% more trademark applications (direct) and 445% more trademark applications (by count). Similarly, migrants in countries that gain had 159% more industrial design applications, 114% more trademark applications (by count), 95% more trademark applications (direct) and 374% more patent applications. In addition, countries that gain had 436% more scientific and technical journal articles, and 267% more trademark applications, in total.

[42] Note: The indicator 'Industrial design applications, resident, by count' (indicator code: IP.IDS.RSCT) was significant but only at the 10% level of significance (90% level of confidence).

This extended analysis thus provides a further insight, that among countries which gained from migration, competition for jobs is no longer a race-to-bottom, based on willingness to settle for lower wages, but instead, a race-to-top, whereby job competitors offer higher standards of productivity.

Conclusion: New lenses for seeing labour migration

In this report, we have found diverging trends across countries as regards the impact of migration on wages. Amid increasing migration, close to half of countries saw wages declining, and close to half saw wages increasing. This split can possibly explain why the interrelated of issue of migration, jobs and wages has been so contentious and divisive.

We have investigated under what circumstances migration can have net positive or net negative impacts on wages, based on existing literature on migration, World Bank databases, and data analysis. We examined further the idea by Brezis and Krugman, that the negative impacts of migration are short-term, and that there could in fact be positive effects of migration, depending on the performance of firms and the structural factors shaping this performance.

Over a period of 10 years (2005 to 2015), countries that have more competitive firms, as well as better structural factors which enable better firm performance, can see wages rising amid increasing migration. In contrast, countries which have less competitive firms and lack institutional support, see wages falling amid increasing migration.

Below are two main recommendations of this report:

1. Provide targeted institutional support to help firms improve their performance and become more competitive. These include a) structural reforms to make it easier to do business (including work on credit registries, trade requirements, transparency, access to credit and start-up costs), while not failing on b) more fundamental reforms, such as infrastructure development for transport and communication, and investments in research, education, and healthcare.

2. Promote innovation and develop human capital. Innovation was found to be strategic, given that countries which gained from migration had a large share of their export receipts from products that were medium- and high-technology in nature, and a larger share of their exports going to high-income economies.

As such, it will be critical to ensure that the innovation potential of a country's firms is high. It is equally important that locals and migrants can work together to produce novel, innovative ideas. As reflected in the findings, residents in countries that gain had approximately 25 times more industrial design applications, and that non-residents had 1.5 times more industrial design applications, than residents and migrants (respectively) in countries that lose. An innovation-focus among countries should thus be encouraged, if countries wish to maximize the benefits of migration.

In sum, countries should rethink their views of migration, in particular, the way they attribute wage changes to migration. Migration will more likely be a net burden to countries, if they do not work on improving their own business environments, to support and enable domestic firms to do better.

Finally, as mentioned earlier, the analyses provided in this Report are preliminary and exploratory in nature. (See Appendix 3 for 'Discussion on Uncertainties'). We hope that the issues raised here can be taken up in future research, to deepen the understanding of the complex relationships between migration, jobs and wages. One potential direction for further research and to expand the assessment of this Report is to go deeper, focusing on particular sectors entered by migrants; disaggregating the migrant population into skilled- and non-skilled workers; looking beyond wages to take into account other forms of compensation, such as pensions and other benefits; and considering the presence of government interventions, such as minimum wage policies and worker quotas. Another is to explore the applicability of the findings here in updating the computable general equilibrium (CGE) model used by the World Bank team in coming up with their report on migration.

Appendix

Appendix 1: Countries that Gain and Lose from Migration

Table A1

Countries that gain from migration: Countries where migration is positively associated with wages (AMSs are highlighted)

1	Afghanistan	21	Chad	41	Guatemala	61	Mauritius	81	South Africa
2	Angola	22	Channel Islands	42	Guinea	62	Mongolia	82	Spain
3	Argentina	23	Chile	43	Guyana	63	Morocco	83	St. Vincent and the Grenadines
4	Australia	24	China	44	Honduras	64	Netherlands	84	Suriname
5	Austria	25	Colombia	45	Hungary	65	New Caledonia	85	Swaziland
6	Bangladesh	26	Comoros	46	Iceland	66	New Zealand	86	Sweden
7	Barbados	27	Costa Rica	47	Iraq	67	Nicaragua	87	Switzerland
8	Belgium	28	Croatia	48	Ireland	68	Niger	88	Syrian Arab Republic
9	Benin	29	Czech Republic	49	Jamaica	69	Nigeria	89	Thailand
10	Bhutan	30	Denmark	50	Japan	70	Panama	90	Togo
11	Bolivia	31	Djibouti	51	Jordan	71	Peru	91	Tonga
12	Botswana	32	Ecuador	52	Kazakhstan	72	Portugal	92	Trinidad and Tobago
13	Brazil	33	Egypt, Arab Rep.	53	Kenya	73	Puerto Rico	93	Tunisia
14	Brunei Darussalam	34	Ethiopia	54	Korea, Rep.	74	Qatar	94	Turkey
15	Bulgaria	35	Fiji	55	Macedonia, FYR	75	Romania	95	Ukraine
16	Burundi	36	Finland	56	Madagascar	76	Saudi Arabia	96	United Kingdom
17	Cabo Verde	37	France	57	Malaysia	77	Singapore	97	United States
18	Cameroon	38	Gabon	58	Maldives	78	Slovak Republic	98	Vietnam
19	Canada	39	Germany	59	Malta	79	Slovenia		
20	Central African Republic	40	Ghana	60	Mauritania	80	Somalia		

Source: Authors based on 'World Development Indicators', World Bank, http://data.worldbank.org accessed December 2017.

Table A2

Countries that lose from migration: Countries where migration is negatively associated with wages (AMSs are highlighted)

1	Albania	21	Gambia, The	41	Libya	61	Rwanda	81	Virgin Islands (U.S.)
2	Algeria	22	Georgia	42	Lithuania	62	Samoa	82	Yemen, Rep.
3	Armenia	23	Greece	43	Luxembourg	63	Sao Tome and Principe	83	Zambia
4	Azerbaijan	24	Guam	44	Macao SAR, China	64	Senegal	84	Zimbabwe
5	Bahamas, The	25	Guinea-Bissau	45	Malawi	65	Serbia		
6	Bahrain	26	Haiti	46	Mali	66	Sierra Leone		
7	Belarus	27	Hong Kong SAR, China	47	Mexico	67	Solomon Islands		
8	Belize	28	India	48	Moldova	68	Sri Lanka		
9	Bosnia and Herzegovina	29	Indonesia	49	Mozambique	69	St. Lucia		
10	Burkina Faso	30	Iran, Islamic Rep.	50	Myanmar	70	Sudan		
11	Cambodia	31	Israel	51	Namibia	71	Tajikistan		
12	Congo, Dem. Rep.	32	Italy	52	Nepal	72	Tanzania		
13	Congo, Rep.	33	Korea, Dem. People's Rep.	53	Norway	73	Timor-Leste		
14	Cote d'Ivoire	34	Kuwait	54	Oman	74	Turkmenistan		
15	Cyprus	35	Kyrgyz Republic	55	Pakistan	75	Uganda		
16	Dominican Republic	36	Lao PDR	56	Papua New Guinea	76	United Arab Emirates		
17	El Salvador	37	Latvia	57	Paraguay	77	Uruguay		
18	Equatorial Guinea	38	Lebanon	58	Philippines	78	Uzbekistan		
19	Estonia	39	Lesotho	59	Poland	79	Vanuatu		
20	French Polynesia	40	Liberia	60	Russian Federation	80	Venezuela, RB		

Source: Authors based on 'World Development Indicators', World Bank, http://data.worldbank.org accessed December 2017

Appendix 2: GDP per Employed Person (Constant 2011 PPP dollars) as a Measure of Wages

The indicator we use for wages in this report is GDP per employed person (constant 2011 PPP dollars), derived from the International Labour Statistics Database, and compiled by the World Bank in their World Development Indicators database. This measures the average output earned for every employed individual, also known as average labour productivity.

The measurement was chosen because it was available for 182 countries, in the periods examined (2005 and 2015), for a total of 364 data points. The use of data on monthly wages from the ILO was also explored, except that it was only available for 81 and 80 countries, in 2005 and 2015, respectively. Moreover, the latter was not available for 8 out of 10 AMSs (Brunei, Cambodia, Myanmar, Malaysia, Laos, Singapore, Vietnam and Thailand) for both periods.[43]

One caveat to this indicator (GDP per Employed Person (Constant 2011 PPP dollars)) is that it may differ from wages for certain reasons.[44] For instance, certain individuals may earn lower wages than what they contribute to a company, given factors such as race, nationality, educational background, marital status, experience, age, or other factors. It can also be influenced by bargaining behaviour, and the balance of power between employers and employees. However, these are factors which are beyond the scope of this study.

Moreover, while these factors may cause the deviation of wages from labour productivity, the extent of deviation would be limited by the need for companies to be viable business entities. Companies performing poorly are expected to be unable to raise wages significantly above the contributions of individuals, lest their labour costs become too large to maintain. At the same time, deflating wages way below the levels of contribution of employees can only be done to a certain extent, i.e. they cannot be too far away from international market rates, lest companies struggle in getting the needed manpower to meet their operational requirements.

The indicator standardizes wages in dollar terms across countries and adjusts for purchasing power parity (PPP) to ensure that inflation is taken into account (in 2011 PPP$).[45]

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[43] 'Mean nominal monthly earnings of employees by sex and economic activity', downloaded on 19 February 2018 03:44 +0100 from ILOSTAT, http://www.ilo.org/ilostat.

[44] Johannes Van Biesebroeck, How tight is the link between wages and productivity? A survey of the literature, Conditions of Work and Employment Series No. 54, Geneva: International Labour Office, 2015.

[45] Definition: 'Purchasing power parity conversion factor is the number of units of a country's currency required to buy the same amounts of goods and services in the domestic market as U.S. dollar would buy in the United States. This conversion factor is for GDP. Historical estimates are provided for the 2005 benchmark year only. A

Appendix 3: Technical Note on Methodology for Comparing Countries that Gain and Lose

We compared countries that gain and lose from migration on the basis of the average levels for each country-level indicator, while taking into account the standard deviation of that indicator. The purpose of this assessment was to identify which factors are significantly different between the two groups.

Computing Differences between Countries that Gain and Lose, by Indicator

First, we compared the average levels for particular country-level indicators. For instance, for export performance, we computed the average total exports per country among countries that gain and lose. We then subtract the average exports of countries that lose from the countries that gain, and divided by the average exports of countries that lose, to compute the percentage difference between the two groups. The formula used is illustrated below.

$$Eq.1\ Percentage\ Difference\ = \frac{average\ for\ gainers - average\ for\ losers}{average\ for\ losers}$$

This formula is the basis for Column 5 of Appendix 4, 'Percentage Difference between Countries that Gain minus Countries that Lose, as percentage of Countries that Lose', which we also cite in the section, 'Re-assessing the impact of migration on jobs and wages', of this report.

Identifying Indicators which are Significantly Different

However, even if there were large differences, these insights may be invalid if there is a wide degree of variance or deviation from that mean, within the group of countries that gain.[46] To avoid reaching any such misleading conclusions, we applied a **two-sample difference of means t-test for each indicator**.[47] The intuition behind this test is to compare the

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separate series is available for extrapolated estimates based on the latest ICP round.' Source: 'World Development Indicators', The World Bank, 2017, accessed 16 January 2018, https://data.worldbank.org/.

[46] In statistical terms, this could lead to a Type 1 error wherein we reject the null hypothesis that the means are not statistically significant, when we should not.

[47] We use the test for difference in means between two samples, assuming unequal variances. The reason is that assuming equal variances, when they are unequal, can lead to an over- or under-estimation of the t-values. 'Independent t-test', Hanover College, http://vault.hanover.edu/~altermattw/courses/220/R/ttest/ttest4.html, accessed 27 February 2018. In this regard, the formulae we use are as below. This is based on Jeremy Orloff and Jonathan Bloom (2014), 'Null Hypothesis Significance Testing III, 18.05 Introduction to Probability in Statistics', MIT OpenCourseWare, https://ocw.mit.edu/courses/mathematics/18-05-introduction-to-probability-and-statistics-spring-2014/readings/MIT18_05S14_Reading19.pdf, accessed 3 April 2018.

differences in averages between countries that gain and countries that lose, in the numerator, with the measurement of the differences within each group, in the denominator.

$$Eq.5\ t-value = \frac{difference\ in\ means\ between\ groups}{difference\ in\ means\ within\ groups}$$

The extent to which the difference in means between countries that gain and lose (numerator) is larger than the differences in means within each of both groups (denominator) for a particular indicator (e.g. exports), shows the extent to which these groups vary with respect to the indicator. The t-value, which results from the equation above, is basically a measurement of the extent to which the numerator is significantly larger than the denominator.

Last, we have defined a threshold for the t-value so that we can put in clearer terms the range of uncertainty that can be tolerated. The pre-identified margin of error which is allowed is usually a maximum of 10%, and the margin of error we use is slightly more conservative, at 5%.[48] This identified range of uncertainty then corresponds to a certain t-value, which serves as the threshold or 'critical value'. If the t-value we obtain from the equation above is greater than the critical value, then we conclude that the two groups are different.

For each indicator, we express our finding that it is/is not statistically significant, with 95% level of confidence (or rather, 5% margin of error) that these countries indeed vary in a particular indicator, unless otherwise specified. We have used this methodology to eliminate factors which were not statistically significant, so that the only factors presented here were those which were statistically significant.[49]

Discussion on Uncertainties

$$Eq.2\ t-value = \frac{mean\ of\ gainers - mean\ of\ losers}{pooled\ sample\ variance}$$

$$Eq.3\ pooled\ sample\ variance: s_p^2 = \frac{s_x^2}{n} + \frac{s_y^2}{m}$$

$$Eq.4\ degrees\ of\ freedom = \frac{(\frac{s_x^2}{n} + \frac{s_y^2}{m})^2}{\frac{(s_x^2/n)^2}{n-1} + \frac{(s_y^2/m)^2}{m-1}}$$

where: n = sample population for countries that gain; m = sample population for countries that lose; s_x^2 = sample variance among countries that gain; s_y^2 = sample variance among countries that lose; s_p^2 = pooled sample variance. Note: the square root of the pooled sample variance is used in equation 2.

[48] In statistical terms, this is the margin of error in rejecting the null hypothesis when it is true.

[49] As indicated in the last page of Appendix 4, we also noted four variables which were significant with 90% level of significance (or a 10% margin of error), i..e Industrial design applications, resident, by count; Time required to start a business (days); Time required to start a business, female (days); and Time required to start a business, male (days).

As the assessment applied a simple t-test, rather than econometric regression, other factors were not controlled for. As such, it is possible that other factors could influence the relationship between migration and wages.

For instance, while this study has found that the factors or conditions related to the ease of doing business have shaped the relationship between migration and wages, it is still possible to add yet another layer of complexity, to see if other factors have in turn shaped the aforementioned relationships between ease of doing business, migration and wages.

In this regard, this study is to be treated as exploratory, recommending further enquiry in complexity thinking and in the analysis of complex systems,[50] as they apply to migration, jobs and wages.

[50] Jay W. Forrester, The Beginning of System Dynamics, Banquet Talk at the international meeting of the System Dynamics Society Stuttgart, Germany July 13, 1989, accessed 4 April 2018, http://web.mit.edu/sysdyn/sd-intro/D-4165-1.pdf.

Appendix 4: Factors which were significantly different between countries that gain and lose from migration

Note: The factors below are those which were found to be significantly different between countries that gain and countries that lose, with a 95% level of confidence. They are arranged alphabetically, according to the indicator code used in the compilation by the World Bank in its World Development Indicators database.

1 Indicator Code in World Development Indicators Database	2 Indicator Name	3 Mean for Countries that Gain	4 Mean for Countries that Lose	5 Percentage Difference between Countries that Gain minus Countries that Lose, as percentage of Countries that Lose
AG.LND.AGRI.K2	Agricultural land (sq. km)	354.3 Thousand	168.9 Thousand	110%
BM.GSR.CMCP.ZS	Communications, computer, etc. (% of service imports, BoP)	36.8	31.8	16%
BM.GSR.FCTY.CD	Primary income payments (BoP, current US$)	28.7 Billion	9.2 Billion	211%
BM.GSR.GNFS.CD	Imports of goods and services (BoP, current US$)	147.0 Billion	43.1 Billion	241%
BM.GSR.MRCH.CD	Goods imports (BoP, current US$)	114.0 Billion	34.1 Billion	234%
BM.GSR.NFSV.CD	Service imports (BoP, current US$)	32.6 Billion	9.1 Billion	260%
BM.GSR.ROYL.CD	Charges for the use of intellectual property, payments (BoP, current US$)	3.2 Billion	389.0 Million	723%
BM.GSR.TOTL.CD	Imports of goods, services and primary income (BoP, current US$)	175.0 Billion	52.4 Billion	234%
BM.GSR.TRVL.ZS	Travel services (% of service imports, BoP)	21.1	24.4	-14%
BM.KLT.DINV.CD.WD	Foreign direct investment, net outflows (BoP, current US$)	15.2 Billion	3.2 Billion	372%
BM.TRF.PRVT.CD	Secondary income, other sectors, payments (BoP, current US$)	5.8 Billion	1.1 Billion	406%
BM.TRF.PWKR.CD.DT	Personal remittances, paid (current US$)	2.6 Billion	1.1 Billion	139%
BN.TRF.CURR.CD	Net secondary income (BoP, current US$)	-2.5 Billion	1.7 Billion	-253%
BX.GSR.CCIS.CD	ICT service exports (BoP, current US$)	10.4 Billion	3.3 Billion	220%
BX.GSR.FCTY.CD	Primary income receipts (BoP, current US$)	29.3 Billion	7.4 Billion	296%
BX.GSR.GNFS.CD	Exports of goods and services (BoP, current US$)	148.0 Billion	44.6 Billion	232%
BX.GSR.MRCH.CD	Goods exports (BoP, current US$)	115.0 Billion	34.8 Billion	230%
BX.GSR.NFSV.CD	Service exports (BoP, current US$)	33.4 Billion	9.9 Billion	239%
BX.GSR.ROYL.CD	Charges for the use of intellectual property, receipts (BoP, current US$)	3.3 Billion	148.0 Million	2103%
BX.GSR.TOTL.CD	Exports of goods, services and primary income (BoP, current US$)	178.0 Billion	52.0 Billion	242%
BX.GSR.TRVL.ZS	Travel services (% of service exports, BoP)	36.9	42.4	-13%
BX.KLT.DINV.CD.WD	Foreign direct investment, net inflows (BoP, current US$)	16.4 Billion	4.0 Billion	312%
BX.TRF.CURR.CD	Secondary income receipts (BoP, current US$)	5.9 Billion	3.4 Billion	75%
BX.TRF.PWKR.DT.GD.ZS	Personal remittances, received (% of GDP)	3.4	5.9	-42%

CM.MKT.LCAP.CD	Market capitalization of listed domestic companies (current US$)	1.1 Trillion	253.0 Billion	319%
CM.MKT.TRAD.CD	Stocks traded, total value (current US$)	1.7 Trillion	140.0 Billion	1093%
DC.DAC.AUSL.CD	Net bilateral aid flows from DAC donors, Australia (current US$)	6.7 Million	27.4 Million	-76%
DC.DAC.DEUL.CD	Net bilateral aid flows from DAC donors, Germany (current US$)	76.2 Million	33.2 Million	130%
DC.DAC.IRLL.CD	Net bilateral aid flows from DAC donors, Ireland (current US$)	2.8 Million	5.8 Million	-53%
DC.DAC.NZLL.CD	Net bilateral aid flows from DAC donors, New Zealand (current US$)	1.1 Million	3.0 Million	-62%
DT.COM.MIBR.CD	Commitments, IBRD (COM, current US$)	178.0 Million	73.2 Million	143%
DT.CUR.OTHC.ZS	Currency composition of PPG debt, all other currencies (%)	15.1	10.7	41%
DT.DIS.IDAG.CD	IDA grants (current US$)	6.1 Million	17.2 Million	-65%
DT.GPA.PRVT	Average grace period on new external debt commitments, private (years)	4.2	2.6	64%
DT.GRE.PRVT	Average grant element on new external debt commitments, private (%)	14.1	9.0	56%
DT.INR.DPPG	Average interest on new external debt commitments (%)	2.7	2.1	26%
DT.INR.PRVT	Average interest on new external debt commitments, private (%)	2.5	1.7	43%
DT.IXA.OFFT.CD	Interest arrears, official creditors (current US$)	49.2 Million	174.0 Million	-72%
DT.MAT.PRVT	Average maturity on new external debt commitments, private (years)	6.6	4.0	65%
DT.NFL.PNGC.CD	PNG, commercial banks and other creditors (NFL, current US$)	1.2 Billion	-17.9 Million	-6972%
DT.NTR.PNGC.CD	PNG, commercial banks and other creditors (NTR, current US$)	972.0 Million	-353.0 Million	-375%
DT.ODA.ODAT.GI.ZS	Net ODA received (% of gross capital formation)	22.2	42.7	-48%
DT.ODA.ODAT.MP.ZS	Net ODA received (% of imports of goods, services and primary income)	8.9	14.1	-37%
DT.TDS.DECT.EX.ZS	Total debt service (% of exports of goods, services and primary income)	14.9	11.4	31%
DT.TDS.DECT.GN.ZS	Total debt service (% of GNI)	5.0	3.8	34%
EA.PRD.AGRI.KD	Agriculture value added per worker (constant 2010 US$)	19.6 Thousand	9.3 Thousand	110%
EG.CFT.ACCS.ZS	Access to clean fuels and technologies for cooking (% of population)	67.0	51.0	31%
EG.ELC.ACCS.ZS	Access to electricity (% of population)	79.3	69.0	15%
EG.ELC.LOSS.ZS	Electric power transmission and distribution losses (% of output)	12.2	15.5	-22%
EG.ELC.NUCL.ZS	Electricity production from nuclear sources (% of total)	12.1	2.1	463%
EG.ELC.RNWX.KH	Electricity production from renewable sources, excluding hydroelectric (kWh)	12.5 Billion	2.6 Billion	384%
EG.ELC.RNWX.ZS	Electricity production from renewable sources, excluding hydroelectric (% of total)	6.5	2.6	151%
EG.USE.PCAP.KG.OE	Energy use (kg of oil equivalent per capita)	3.0 Thousand	2.0 Thousand	50%
EN.URB.LCTY	Population in largest city	4.7 Million	3.1 Million	53%
EN.URB.LCTY.UR.ZS	Population in the largest city (% of urban population)	30.6	35.6	-14%
FB.ATM.TOTL.P5	Automated teller machines (ATMs) (per 100,000 adults)	50.9	31.6	61%
FB.CBK.DPTR.P3	Depositors with commercial banks (per 1,000 adults)	1.4 Thousand	762.1	85%
FD.AST.PRVT.GD.ZS	Domestic credit to private sector by banks (% of GDP)	56.3	38.3	47%
FD.RES.LIQU.AS.ZS	Bank liquid reserves to bank assets ratio (%)	17.7	22.5	-21%
FI.RES.TOTL.CD	Total reserves (includes gold, current US$)	71.2 Billion	21.2 Billion	236%
FI.RES.XGLD.CD	Total reserves minus gold (current US$)	65.0 Billion	19.1 Billion	240%
FM.LBL.BMNY.GD.ZS	Broad money (% of GDP)	64.4	50.7	27%

FM.LBL.BMNY.ZG	Broad money growth (annual %)	12.6	16.0	-21%
FS.AST.DOMO.GD.ZS	Claims on other sectors of the domestic economy (% of GDP)	69.5	43.3	61%
FS.AST.DOMS.GD.ZS	Domestic credit provided by financial sector (% of GDP)	79.0	49.7	59%
FS.AST.PRVT.GD.ZS	Domestic credit to private sector (% of GDP)	61.2	39.4	55%
GB.XPD.RSDV.GD.ZS	Research and development expenditure (% of GDP)	1.3	0.6	110%
GC.NFN.TOTL.GD.ZS	Net investment in nonfinancial assets (% of GDP)	2.9	4.1	-29%
GC.REV.GOTR.ZS	Grants and other revenue (% of revenue)	19.0	26.9	-29%
GC.TAX.IMPT.ZS	Customs and other import duties (% of tax revenue)	7.8	13.1	-41%
GC.TAX.INTT.RV.ZS	Taxes on international trade (% of revenue)	5.7	10.3	-45%
GC.TAX.TOTL.GD.ZS	Tax revenue (% of GDP)	18.0	15.7	15%
GC.TAX.YPKG.RV.ZS	Taxes on income, profits and capital gains (% of revenue)	27.7	18.6	49%
GC.TAX.YPKG.ZS	Taxes on income, profits and capital gains (% of total taxes)	41.4	28.8	44%
GC.XPN.COMP.ZS	Compensation of employees (% of expense)	23.2	28.0	-17%
GC.XPN.GSRV.ZS	Goods and services expense (% of expense)	14.5	18.2	-21%
GC.XPN.TOTL.GD.ZS	Expense (% of GDP)	27.4	23.6	16%
GC.XPN.TRFT.ZS	Subsidies and other transfers (% of expense)	42.3	34.7	22%
IC.BUS.DFRN.XQ	Distance to frontier score (0=lowest performance to 100=frontier)	62.6	58.3	7%
IC.CRD.PRVT.ZS	Private credit bureau coverage (% of adults)	29.0	18.8	54%
IC.CRD.PUBL.ZS	Public credit registry coverage (% of adults)	9.7	5.8	68%
IC.EXP.DOCS	Documents to export (number)	6.1	7.2	-15%
IC.EXP.TMBC	Time to export, border compliance (hours)	48.6	73.2	-34%
IC.FRM.BKWC.ZS	Firms using banks to finance working capital (% of firms)	34.1	26.2	30%
IC.FRM.CORR.ZS	Informal payments to public officials (% of firms)	28.1	43.8	-36%
IC.IMP.DOCS	Documents to import (number)	7.5	9.0	-17%
IC.IMP.DURS	Time to import (days)	28.5	35.9	-20%
IC.REG.COST.PC.FE.ZS	Cost of business start-up procedures, female (% of GNI per capita)	42.3	69.0	-39%
IC.REG.COST.PC.MA.ZS	Cost of business start-up procedures, male (% of GNI per capita)	42.3	69.0	-39%
IC.REG.COST.PC.ZS	Cost of business start-up procedures (% of GNI per capita)	42.3	69.0	-39%
IC.REG.DURS *	Time required to start a business (days) *	30.4	41.6	-27%
IC.REG.DURS.FE *	Time required to start a business, female (days) *	30.4	41.7	-27%
IC.REG.DURS.MA *	Time required to start a business, male (days) *	30.3	41.6	-27%
IC.TAX.GIFT.ZS	Firms expected to give gifts in meetings with tax officials (% of firms)	25.0	44.8	-44%
IC.TAX.PAYM	Tax payments (number)	26.2	35.0	-25%
IC.WRH.DURS	Time required to build a warehouse (days)	174.4	203.4	-14%
IC.WRH.PROC	Procedures to build a warehouse (number)	14.9	16.1	-8%
IE.PPN.ENGY.CD	Public private partnerships investment in energy (current US$)	1.3 Billion	602.0 Million	114%
IP.IDS.NRCT	Industrial design applications, nonresident, by count	1.9 Thousand	717.4	159%
IP.IDS.RSCT*	Industrial design applications, resident, by count*	12.4 Thousand	481.9	2463%
IP.JRN.ARTC.SC	Scientific and technical journal articles	12.7 Thousand	2.4 Thousand	436%
IP.PAT.NRES	Patent applications, nonresidents	10.3 Thousand	2.2 Thousand	374%
IP.PAT.RESD	Patent applications, residents	23.9 Thousand	1.3 Thousand	1784%

IP.TMK.NRCT	Trademark applications, nonresident, by count	16.0 Thousand	7.5 Thousand	114%
IP.TMK.NRES	Trademark applications, direct nonresident	8.4 Thousand	4.3 Thousand	95%
IP.TMK.RESD	Trademark applications, direct resident	27.4 Thousand	8.4 Thousand	226%
IP.TMK.RSCT	Trademark applications, resident, by count	68.4 Thousand	12.6 Thousand	445%
IP.TMK.TOTL	Trademark applications, total	36.1 Thousand	9.8 Thousand	267%
IQ.WEF.PORT.XQ	Quality of port infrastructure, WEF (1=extremely underdeveloped to 7=well developed and efficient by international standards)	4.2	3.7	14%
IS.AIR.DPRT	Air transport, registered carrier departures worldwide	319.6 Thousand	66.7 Thousand	379%
IS.AIR.GOOD.MT.K1	Air transport, freight (million ton-km)	1.8 Thousand	564.8	215%
IS.AIR.PSGR	Air transport, passengers carried	30.0 Million	6.7 Million	351%
IS.SHP.GCNW.XQ	Liner shipping connectivity index (maximum value in 2004 = 100)	29.3	17.2	70%
IS.SHP.GOOD.TU	Container port traffic (TEU: 20 foot equivalent units)	7.2 Million	3.0 Million	141%
IT.MLT.MAIN	Fixed telephone subscriptions	9.3 Million	2.8 Million	237%
IT.MLT.MAIN.P2	Fixed telephone subscriptions (per 100 people)	20.7	14.8	40%
IT.NET.BBND	Fixed broadband subscriptions	5.0 Million	1.0 Million	376%
IT.NET.BBND.P2	Fixed broadband subscriptions (per 100 people)	10.3	6.3	64%
IT.NET.SECR	Secure Internet servers	10.0 Thousand	809.1	1133%
IT.NET.SECR.P6	Secure Internet servers (per 1 million people)	279.8	108.1	159%
IT.NET.USER.ZS	Individuals using the Internet (% of population)	38.2	27.8	38%
MS.MIL.XPND.GD.ZS	Military expenditure (% of GDP)	1.8	2.2	-19%
NE.CON.GOVT.CD	General government final consumption expenditure (current US$)	95.7 Billion	19.7 Billion	386%
NE.CON.GOVT.KD	General government final consumption expenditure (constant 2010 US$)	124.0 Billion	26.9 Billion	361%
NE.CON.PETC.CD	Household final consumption expenditure, etc. (current US$)	330.0 Billion	78.9 Billion	318%
NE.CON.PETC.ZS	Household final consumption expenditure, etc. (% of GDP)	62.2	68.1	-9%
NE.CON.PRVT.CD	Household final consumption expenditure (current US$)	331.0 Billion	76.3 Billion	334%
NE.CON.PRVT.KD	Household final consumption expenditure (constant 2010 US$)	414.0 Billion	100.0 Billion	314%
NE.CON.PRVT.PC.KD	Household final consumption expenditure per capita (constant 2010 US$)	9.6 Thousand	6.2 Thousand	55%
NE.CON.PRVT.PP.CD	Household final consumption expenditure, PPP (current international $)	394.0 Billion	175.0 Billion	125%
NE.CON.PRVT.PP.KD	Household final consumption expenditure, PPP (constant 2011 international $)	463.0 Billion	190.0 Billion	144%
NE.CON.TETC.CD	Final consumption expenditure, etc. (current US$)	423.0 Billion	98.8 Billion	328%
NE.CON.TETC.KD	Final consumption expenditure, etc. (constant 2010 US$)	514.0 Billion	128.0 Billion	302%
NE.CON.TETC.ZS	Final consumption expenditure, etc. (% of GDP)	78.8	83.5	-6%
NE.CON.TOTL.CD	Final consumption expenditure (current US$)	427.0 Billion	100.0 Billion	327%
NE.CON.TOTL.KD	Final consumption expenditure (constant 2010 US$)	538.0 Billion	130.0 Billion	314%
NE.DAB.TOTL.CD	Gross national expenditure (current US$)	567.0 Billion	132.0 Billion	330%
NE.DAB.TOTL.KD	Gross national expenditure (constant 2010 US$)	662.0 Billion	173.0 Billion	283%
NE.EXP.GNFS.CD	Exports of goods and services (current US$)	144.0 Billion	45.0 Billion	220%
NE.EXP.GNFS.KD	Exports of goods and services (constant 2010 US$)	176.0 Billion	60.4 Billion	191%
NE.GDI.FTOT.CD	Gross fixed capital formation (current US$)	141.0 Billion	30.5 Billion	362%
NE.GDI.FTOT.KD	Gross fixed capital formation (constant 2010 US$)	179.0 Billion	41.0 Billion	337%
NE.GDI.TOTL.CD	Gross capital formation (current US$)	143.0 Billion	33.0 Billion	333%
NE.GDI.TOTL.KD	Gross capital formation (constant 2010 US$)	185.0 Billion	44.4 Billion	317%

NE.IMP.GNFS.CD	Imports of goods and services (current US$)	142.0 Billion	43.1 Billion	229%
NE.IMP.GNFS.KD	Imports of goods and services (constant 2010 US$)	176.0 Billion	54.6 Billion	222%
NV.AGR.TOTL.ZS	Agriculture, value added (% of GDP)	11.1	16.2	-32%
NV.IND.MANF.CD	Manufacturing, value added (current US$)	91.6 Billion	19.7 Billion	365%
NV.IND.MANF.KD	Manufacturing, value added (constant 2010 US$)	80.4 Billion	25.1 Billion	220%
NV.IND.MANF.ZS	Manufacturing, value added (% of GDP)	15.2	12.0	27%
NV.IND.TOTL.CD	Industry, value added (current US$)	142.0 Billion	37.6 Billion	278%
NV.IND.TOTL.KD	Industry, value added (constant 2010 US$)	165.0 Billion	50.1 Billion	229%
NV.MNF.FBTO.ZS.UN	Food, beverages and tobacco (% of value added in manufacturing)	18.2	26.4	-31%
NV.MNF.MTRN.ZS.UN	Machinery and transport equipment (% of value added in manufacturing)	16.3	10.9	49%
NV.MNF.TECH.ZS.UN	Medium and high-tech industry (% manufacturing value added)	0.3	0.2	39%
NV.SRV.TETC.CD	Services, etc., value added (current US$)	349.0 Billion	72.3 Billion	383%
NV.SRV.TETC.KD	Services, etc., value added (constant 2010 US$)	399.0 Billion	89.2 Billion	347%
NV.SRV.TETC.KD.ZG	Services, etc., value added (annual % growth)	3.9	5.1	-22%
NY.ADJ.AEDU.CD	Adjusted savings: education expenditure (current US$)	22.7 Billion	4.7 Billion	379%
NY.ADJ.DKAP.CD	Adjusted savings: consumption of fixed capital (current US$)	88.9 Billion	14.7 Billion	505%
NY.ADJ.DKAP.GN.ZS	Adjusted savings: consumption of fixed capital (% of GNI)	13.3	11.0	21%
NY.ADJ.DMIN.CD	Adjusted savings: mineral depletion (current US$)	815.0 Million	290.0 Million	181%
NY.ADJ.DPEM.GN.ZS	Adjusted savings: particulate emission damage (% of GNI)	0.7	1.0	-31%
NY.ADJ.NNTY.CD	Adjusted net national income (current US$)	477.0 Billion	114.0 Billion	318%
NY.ADJ.NNTY.KD	Adjusted net national income (constant 2010 US$)	597.0 Billion	168.0 Billion	255%
NY.ADJ.NNTY.PC.CD	Adjusted net national income per capita (current US$)	11.6 Thousand	6.8 Thousand	72%
NY.ADJ.NNTY.PC.KD	Adjusted net national income per capita (constant 2010 US$)	15.5 Thousand	8.9 Thousand	74%
NY.ADJ.SVNG.CD	Adjusted net savings, including particulate emission damage (current US$)	74.9 Billion	21.2 Billion	253%
NY.ADJ.SVNX.CD	Adjusted net savings, excluding particulate emission damage (current US$)	74.6 Billion	21.5 Billion	247%
NY.GDP.FCST.CD	Gross value added at factor cost (current US$)	489.0 Billion	124.0 Billion	294%
NY.GDP.FCST.KD	Gross value added at factor cost (constant 2010 US$)	556.0 Billion	157.0 Billion	254%
NY.GDP.MKTP.CD	GDP (current US$)	530.0 Billion	121.0 Billion	338%
NY.GDP.MKTP.KD	GDP (constant 2010 US$)	580.0 Billion	144.0 Billion	303%
NY.GDP.MKTP.PP.CD	GDP, PPP (current international $)	709.0 Billion	287.0 Billion	147%
NY.GDP.MKTP.PP.KD	GDP, PPP (constant 2011 international $)	718.0 Billion	299.0 Billion	140%
NY.GDP.PCAP.CD	GDP per capita (current US$)	14.3 Thousand	9.3 Thousand	53%
NY.GDP.PCAP.KD	GDP per capita (constant 2010 US$)	15.8 Thousand	10.5 Thousand	51%
NY.GDP.PCAP.PP.CD	GDP per capita, PPP (current international $)	19.3 Thousand	14.2 Thousand	36%
NY.GDP.PCAP.PP.KD	GDP per capita, PPP (constant 2011 international $)	19.8 Thousand	14.7 Thousand	34%
NY.GDS.TOTL.CD	Gross domestic savings (current US$)	145.0 Billion	35.2 Billion	312%
NY.GDS.TOTL.ZS	Gross domestic savings (% of GDP)	21.2	16.5	29%
NY.GNP.ATLS.CD	GNI, Atlas method (current US$)	554.0 Billion	129.0 Billion	329%
NY.GNP.MKTP.CD	GNI (current US$)	535.0 Billion	123.0 Billion	335%
NY.GNP.MKTP.KD	GNI (constant 2010 US$)	677.0 Billion	175.0 Billion	287%
NY.GNP.MKTP.PP.CD	GNI, PPP (current international $)	712.0 Billion	286.0 Billion	149%

NY.GNP.MKTP.PP.KD	GNI, PPP (constant 2011 international $)	738.0 Billion	346.0 Billion	113%
NY.GNP.PCAP.CD	GNI per capita, Atlas method (current US$)	14.7 Thousand	8.6 Thousand	70%
NY.GNP.PCAP.KD	GNI per capita (constant 2010 US$)	19.0 Thousand	10.6 Thousand	79%
NY.GNP.PCAP.PP.CD	GNI per capita, PPP (current international $)	18.9 Thousand	13.7 Thousand	38%
NY.GNP.PCAP.PP.KD	GNI per capita, PPP (constant 2011 international $)	22.8 Thousand	15.1 Thousand	51%
NY.GNS.ICTR.CD	Gross savings (current US$)	155.0 Billion	37.2 Billion	317%
NY.TAX.NIND.CD	Net taxes on products (current US$)	34.0 Billion	11.8 Billion	188%
NY.TRF.NCTR.CD	Net current transfers from abroad (current US$)	-2.8 Billion	1.7 Billion	-271%
PA.NUS.PPPC.RF	Price level ratio of PPP conversion factor (GDP) to market exchange rate	0.6	0.5	21%
SE.PRE.ENRR	School enrollment, preprimary (% gross)	64.2	53.6	20%
SE.PRE.ENRR.FE	School enrollment, preprimary, female (% gross)	63.9	52.6	22%
SE.PRE.ENRR.MA	School enrollment, preprimary, male (% gross)	64.1	52.6	22%
SE.PRM.NINT.FE.ZS	Net intake rate in grade 1, female (% of official school-age population)	70.1	62.5	12%
SE.PRM.NINT.MA.ZS	Net intake rate in grade 1, male (% of official school-age population)	70.9	63.1	12%
SE.PRM.NINT.ZS	Net intake rate in grade 1 (% of official school-age population)	70.6	62.8	12%
SE.SEC.ENRL.VO.FE.ZS	Secondary education, vocational pupils (% female)	42.6	38.9	9%
SE.SEC.ENRR	School enrollment, secondary (% gross)	85.0	74.2	15%
SE.SEC.ENRR.FE	School enrollment, secondary, female (% gross)	85.1	74.9	14%
SE.SEC.ENRR.MA	School enrollment, secondary, male (% gross)	84.9	74.9	13%
SE.TER.CUAT.DO.FE.ZS	Educational attainment, Doctoral or equivalent, population 25+, female (%) (cumulative)	0.7	0.3	110%
SE.TER.CUAT.DO.MA.ZS	Educational attainment, Doctoral or equivalent, population 25+, male (%) (cumulative)	1.2	0.5	115%
SE.TER.CUAT.DO.ZS	Educational attainment, Doctoral or equivalent, population 25+, total (%) (cumulative)	0.9	0.4	116%
SE.TER.CUAT.MS.MA.ZS	Educational attainment, at least Master's or equivalent, population 25+, male (%) (cumulative)	9.0	4.7	91%
SE.TER.CUAT.MS.ZS	Educational attainment, at least Master's or equivalent, population 25+, total (%) (cumulative)	8.6	4.9	73%
SE.TER.ENRR	School enrollment, tertiary (% gross)	41.3	34.1	21%
SE.TER.ENRR.MA	School enrollment, tertiary, male (% gross)	38.3	31.3	23%
SE.XPD.SECO.ZS	Expenditure on secondary education (% of government expenditure on education)	37.8	33.3	14%
SE.XPD.TOTL.GD.ZS	Government expenditure on education, total (% of GDP)	4.9	4.0	23%
SG.GEN.PARL.ZS	Proportion of seats held by women in national parliaments (%)	19.5	16.5	18%
SG.LAW.NODC.HR	Law mandates nondiscrimination based on gender in hiring (1=yes; 0=no)	0.5	0.3	61%
SH.ANM.ALLW.ZS	Prevalence of anemia among women of reproductive age (% of women ages 15-49)	26.9	33.1	-19%
SH.ANM.CHLD.ZS	Prevalence of anemia among children (% of children under 5)	33.9	41.6	-19%
SH.ANM.NPRG.ZS	Prevalence of anemia among non-pregnant women (% of women ages 15-49)	26.6	32.8	-19%
SH.CON.1524.MA.ZS	Condom use, population ages 15-24, male (% of males ages 15-24)	22.9	42.0	-46%
SH.DTH.COMM.ZS	Cause of death, by communicable diseases and maternal, prenatal and nutrition conditions (% of total)	22.8	27.8	-18%
SH.DTH.NCOM.ZS	Cause of death, by non-communicable diseases (% of total)	68.0	62.8	8%
SH.DYN.AIDS.FE.ZS	Women's share of population ages 15+ living with HIV (%)	37.7	43.1	-12%
SH.DYN.MORT	Mortality rate, under-5 (per 1,000 live births)	35.8	45.9	-22%

SH.DYN.NCOM.ZS	Mortality from CVD, cancer, diabetes or CRD between exact ages 30 and 70 (%)	18.8	22.1	-15%
SH.DYN.NMRT	Mortality rate, neonatal (per 1,000 live births)	14.2	18.0	-21%
SH.H2O.BASW.RU.ZS	People using basic drinking water services, rural (% of rural population)	78.5	72.0	9%
SH.H2O.BASW.UR.ZS	People using basic drinking water services, urban (% of urban population)	94.0	90.9	3%
SH.H2O.BASW.ZS	People using basic drinking water services (% of population)	87.1	81.6	7%
SH.H2O.SAFE.ZS	Improved water source (% of population with access)	88.6	84.7	5%
SH.H2O.SMDW.ZS	People using safely managed drinking water services (% of population)	82.6	71.4	16%
SH.HIV.ARTC.ZS	Antiretroviral therapy coverage (% of people living with HIV)	29.8	23.3	28%
SH.MMR.RISK	Lifetime risk of maternal death (1 in: rate varies by country)	3.2 Thousand	2.2 Thousand	43%
SH.PRG.ANEM	Prevalence of anemia among pregnant women (%)	33.0	37.5	-12%
SH.PRV.SMOK.MA	Smoking prevalence, males (% of adults)	32.5	38.9	-16%
SH.STA.ACSN	Improved sanitation facilities (% of population with access)	74.9	66.9	12%
SH.STA.ACSN.RU	Improved sanitation facilities, rural (% of rural population with access)	68.3	60.9	12%
SH.STA.BASS.ZS	People using basic sanitation services (% of population)	75.2	67.9	11%
SH.STA.TRAF.P5	Mortality caused by road traffic injury (per 100,000 people)	16.3	20.4	-20%
SH.TBS.CURE.ZS	Tuberculosis treatment success rate (% of new cases)	77.1	80.6	-4%
SH.TBS.INCD	Incidence of tuberculosis (per 100,000 people)	109.1	162.7	-33%
SH.UHC.OOPC.10.ZS	Proportion of population spending more than 10% of household consumption or income on out-of-pocket health care expenditure (%)	6.1	9.4	-35%
SH.XPD.EXTR.ZS	External resources for health (% of total expenditure on health)	6.8	11.6	-41%
SH.XPD.OOPC.TO.ZS	Out-of-pocket health expenditure (% of total expenditure on health)	32.4	39.8	-19%
SH.XPD.PCAP	Health expenditure per capita (current US$)	975.1	424.9	129%
SH.XPD.PCAP.PP.KD	Health expenditure per capita, PPP (constant 2011 international $)	1.1 Thousand	588.8	85%
SH.XPD.PUBL	Health expenditure, public (% of total health expenditure)	59.2	49.9	19%
SH.XPD.PUBL.ZS	Health expenditure, public (% of GDP)	3.9	2.9	34%
SI.POV.RUGP	Rural poverty gap at national poverty lines (%)	28.3	11.8	139%
SI.POV.RUHC	Rural poverty headcount ratio at national poverty lines (% of rural population)	53.1	37.7	41%
SL.AGR.EMPL.FE.ZS	Employment in agriculture, female (% of female employment) (modeled ILO estimate)	22.8	33.8	-33%
SL.AGR.EMPL.MA.ZS	Employment in agriculture, male (% of male employment) (modeled ILO estimate)	23.6	32.0	-26%
SL.AGR.EMPL.ZS	Employment in agriculture (% of total employment) (modeled ILO estimate)	23.1	32.9	-30%
SL.EMP.1524.SP.FE.NE.ZS	Employment to population ratio, ages 15-24, female (%) (national estimate)	35.6	28.6	24%
SL.EMP.1524.SP.NE.ZS	Employment to population ratio, ages 15-24, total (%) (national estimate)	39.1	33.9	16%
SL.EMP.MPYR.MA.ZS	Employers, male (% of male employment) (modeled ILO estimate)	5.9	4.1	44%
SL.EMP.MPYR.ZS	Employers, total (% of total employment) (modeled ILO estimate)	4.7	3.1	50%
SL.EMP.SELF.FE.ZS	Self-employed, female (% of female employment) (modeled ILO estimate)	37.1	48.1	-23%
SL.EMP.SELF.MA.ZS	Self-employed, male (% of male employment) (modeled ILO estimate)	36.4	46.0	-21%
SL.EMP.SELF.ZS	Self-employed, total (% of total employment) (modeled	36.7	47.1	-22%

	ILO estimate)			
SL.EMP.VULN.FE.ZS	Vulnerable employment, female (% of female employment) (modeled ILO estimate)	34.1	46.3	-26%
SL.EMP.VULN.MA.ZS	Vulnerable employment, male (% of male employment) (modeled ILO estimate)	30.6	42.0	-27%
SL.EMP.VULN.ZS	Vulnerable employment, total (% of total employment) (modeled ILO estimate)	31.9	43.9	-27%
SL.EMP.WORK.FE.ZS	Wage and salaried workers, female (% of female employment) (modeled ILO estimate)	62.9	51.9	21%
SL.EMP.WORK.MA.ZS	Wage and salaried workers, male (% of male employment) (modeled ILO estimate)	63.6	54.0	18%
SL.EMP.WORK.ZS	Wage and salaried workers, total (% of total employment) (modeled ILO estimate)	63.3	52.9	20%
SL.FAM.WORK.FE.ZS	Contributing family workers, female (% of female employment) (modeled ILO estimate)	11.2	15.9	-30%
SL.FAM.WORK.MA.ZS	Contributing family workers, male (% of male employment) (modeled ILO estimate)	4.7	7.6	-38%
SL.FAM.WORK.ZS	Contributing family workers, total (% of total employment) (modeled ILO estimate)	7.2	11.0	-35%
SL.IND.EMPL.MA.ZS	Employment in industry, male (% of male employment) (modeled ILO estimate)	26.2	22.4	17%
SL.IND.EMPL.ZS	Employment in industry (% of total employment) (modeled ILO estimate)	20.6	18.0	15%
SL.SRV.EMPL.FE.ZS	Employment in services, female (% of female employment) (modeled ILO estimate)	64.9	54.8	19%
SL.SRV.EMPL.MA.ZS	Employment in services, male (% of male employment) (modeled ILO estimate)	50.2	45.6	10%
SL.SRV.EMPL.ZS	Employment in services (% of total employment) (modeled ILO estimate)	56.3	49.1	15%
SL.TLF.ACTI.1524.FE.NE.ZS	Labor force participation rate for ages 15-24, female (%) (national estimate)	41.5	35.1	18%
SL.TLF.ACTI.1524.MA.NE.ZS	Labor force participation rate for ages 15-24, male (%) (national estimate)	51.7	47.3	9%
SL.TLF.ACTI.1524.NE.ZS	Labor force participation rate for ages 15-24, total (%) (national estimate)	46.6	41.4	13%
SL.TLF.INTM.ZS	Labor force with intermediate education (% of total working-age population with intermediate education)	60.4	55.1	10%
SL.UEM.ADVN.FE.ZS	Unemployment with advanced education, female (% of female labor force with advanced education)	4.9	6.8	-29%
SL.UEM.ADVN.MA.ZS	Unemployment with advanced education, male (% of male labor force with advanced education)	5.4	8.3	-35%
SL.UEM.ADVN.ZS	Unemployment with advanced education (% of total labor force with advanced education)	6.1	10.7	-43%
SL.UEM.NEET.FE.ZS	Share of youth not in education, employment or training, female (% of female youth population)	16.8	21.0	-20%
SL.UEM.NEET.MA.ZS	Share of youth not in education, employment or training, male (% of male youth population)	11.4	15.6	-27%
SL.UEM.NEET.ZS	Share of youth not in education, employment or training, total (% of youth population)	13.9	18.0	-22%
SL.UEM.TOTL.MA.ZS	Unemployment, male (% of male labor force) (modeled ILO estimate)	7.4	8.7	-14%
SL.UEM.TOTL.ZS	Unemployment, total (% of total labor force) (modeled ILO estimate)	8.2	9.6	-14%
SM.POP.TOTL	International migrant stock, total	1.5 Million	791.4 Thousand	93%
SN.ITK.DEFC.ZS	Prevalence of undernourishment (% of population)	10.1	15.2	-34%
SN.ITK.DFCT	Depth of the food deficit (kilocalories per person per day)	98.0	139.2	-30%
SP.DYN.CBRT.IN	Birth rate, crude (per 1,000 people)	20.8	23.7	-12%
SP.DYN.CONM.ZS	Contraceptive prevalence, modern methods (% of women ages 15-49)	46.6	33.7	38%
SP.DYN.IMRT.IN	Mortality rate, infant (per 1,000 live births)	25.4	33.3	-24%
SP.DYN.LE00.FE.IN	Life expectancy at birth, female (years)	73.9	71.1	4%
SP.DYN.LE00.IN	Life expectancy at birth, total (years)	71.4	68.6	4%

SP.DYN.LE00.MA.IN	Life expectancy at birth, male (years)	69.0	66.2	4%
SP.DYN.TFRT.IN	Fertility rate, total (births per woman)	2.8	3.1	-11%
SP.DYN.TO65.FE.ZS	Survival to age 65, female (% of cohort)	78.8	75.0	5%
SP.DYN.TO65.MA.ZS	Survival to age 65, male (% of cohort)	70.3	65.6	7%
SP.POP.0004.FE.5Y	Population ages 0-4, female (% of female population)	9.6	10.8	-11%
SP.POP.0004.MA.5Y	Population ages 0-4, male (% of male population)	9.9	11.2	-11%
SP.POP.0014.FE.ZS	Population ages 0-14, female (% of total)	27.4	30.4	-10%
SP.POP.0014.MA.ZS	Population ages 0-14, male (% of total)	28.4	31.4	-10%
SP.POP.0014.TO.ZS	Population ages 0-14 (% of total)	27.8	30.8	-10%
SP.POP.0509.FE.5Y	Population ages 5-9, female (% of female population)	9.1	10.1	-10%
SP.POP.0509.MA.5Y	Population ages 5-9, male (% of male population)	9.4	10.4	-10%
SP.POP.1014.FE.5Y	Population ages 10-14, female (% of female population)	8.7	9.5	-8%
SP.POP.1014.MA.5Y	Population ages 10-14, male (% of male population)	9.0	9.8	-8%
SP.POP.1519.FE.5Y	Population ages 15-19, female (% of female population)	8.4	9.1	-8%
SP.POP.1519.MA.5Y	Population ages 15-19, male (% of male population)	8.7	9.4	-7%
SP.POP.2024.FE.5Y	Population ages 20-24, female (% of female population)	8.1	8.7	-6%
SP.POP.2024.MA.5Y	Population ages 20-24, male (% of male population)	8.4	8.9	-5%
SP.POP.2529.FE.5Y	Population ages 25-29, female (% of female population)	7.7	8.0	-4%
SP.POP.4044.FE.5Y	Population ages 40-44, female (% of female population)	6.2	5.8	6%
SP.POP.4549.FE.5Y	Population ages 45-49, female (% of female population)	5.6	5.2	8%
SP.POP.4549.MA.5Y	Population ages 45-49, male (% of male population)	5.6	5.2	9%
SP.POP.5054.FE.5Y	Population ages 50-54, female (% of female population)	5.0	4.5	11%
SP.POP.5054.MA.5Y	Population ages 50-54, male (% of male population)	5.0	4.4	13%
SP.POP.5559.FE.5Y	Population ages 55-59, female (% of female population)	4.3	3.8	15%
SP.POP.5559.MA.5Y	Population ages 55-59, male (% of male population)	4.2	3.6	17%
SP.POP.6064.FE.5Y	Population ages 60-64, female (% of female population)	3.6	3.0	19%
SP.POP.6064.MA.5Y	Population ages 60-64, male (% of male population)	3.4	2.8	22%
SP.POP.6569.FE.5Y	Population ages 65-69, female (% of female population)	3.0	2.5	20%
SP.POP.6569.MA.5Y	Population ages 65-69, male (% of male population)	2.8	2.2	23%
SP.POP.65UP.FE.ZS	Population ages 65 and above, female (% of total)	9.8	7.7	27%
SP.POP.65UP.MA.ZS	Population ages 65 and above, male (% of total)	7.6	5.9	29%
SP.POP.65UP.TO.ZS	Population ages 65 and above (% of total)	8.7	6.8	27%
SP.POP.7074.FE.5Y	Population ages 70-74, female (% of female population)	2.4	1.9	24%
SP.POP.7074.MA.5Y	Population ages 70-74, male (% of male population)	2.0	1.6	28%
SP.POP.7579.FE.5Y	Population ages 75-79, female (% of female population)	1.9	1.6	23%
SP.POP.7579.MA.5Y	Population ages 75-79, male (% of male population)	1.5	1.1	28%
SP.POP.80UP.FE.5Y	Population ages 80 and above, female (% of female population)	2.4	1.7	44%
SP.POP.80UP.MA.5Y	Population ages 80 and above, male (% of male population)	1.4	0.9	46%
SP.POP.DPND.OL	Age dependency ratio, old (% of working-age population)	13.4	10.6	26%
SP.POP.DPND.YG	Age dependency ratio, young (% of working-age population)	46.1	52.1	-12%
SP.POP.SCIE.RD.P6	Researchers in R&D (per million people)	2.7 Thousand	1.4 Thousand	87%
SP.RUR.TOTL.ZG	Rural population growth (annual %)	0.2	0.8	-74%
SP.RUR.TOTL.ZS	Rural population (% of total population)	40.3	47.0	-14%

SP.URB.TOTL.IN.ZS	Urban population (% of total)	59.7	53.0	12%
ST.INT.ARVL	International tourism, number of arrivals	7.8 Million	3.6 Million	116%
ST.INT.RCPT.CD	International tourism, receipts (current US$)	9.8 Billion	3.1 Billion	213%
ST.INT.RCPT.XP.ZS	International tourism, receipts (% of total exports)	13.3	18.1	-26%
ST.INT.TRNR.CD	International tourism, receipts for passenger transport items (current US$)	1.7 Billion	414.0 Million	306%
ST.INT.TRNX.CD	International tourism, expenditures for passenger transport items (current US$)	1.5 Billion	349.0 Million	333%
ST.INT.TVLR.CD	International tourism, receipts for travel items (current US$)	8.7 Billion	2.9 Billion	202%
ST.INT.TVLX.CD	International tourism, expenditures for travel items (current US$)	8.6 Billion	2.4 Billion	259%
ST.INT.XPND.CD	International tourism, expenditures (current US$)	9.7 Billion	2.7 Billion	262%
ST.INT.XPND.MP.ZS	International tourism, expenditures (% of total imports)	6.0	7.1	-15%
TM.VAL.FOOD.ZS.UN	Food imports (% of merchandise imports)	11.8	14.5	-19%
TM.VAL.MANF.ZS.UN	Manufactures imports (% of merchandise imports)	67.6	64.0	6%
TM.VAL.MRCH.CD.WT	Merchandise imports (current US$)	113.0 Billion	33.8 Billion	234%
TM.VAL.MRCH.HI.ZS	Merchandise imports from high-income economies (% of total merchandise imports)	60.6	53.6	13%
TM.VAL.MRCH.OR.ZS	Merchandise imports from low- and middle-income economies outside region (% of total merchandise imports)	22.1	18.9	17%
TM.VAL.MRCH.R2.ZS	Merchandise imports from low- and middle-income economies in Europe & Central Asia (% of total merchandise imports)	5.8	9.8	-40%
TM.VAL.MRCH.R6.ZS	Merchandise imports from low- and middle-income economies in Sub-Saharan Africa (% of total merchandise imports)	5.7	9.3	-39%
TM.VAL.MRCH.WL.CD	Merchandise imports by the reporting economy (current US$)	111.0 Billion	33.7 Billion	229%
TM.VAL.MRCH.WR.ZS	Merchandise imports from low- and middle-income economies within region (% of total merchandise imports)	22.7	33.1	-31%
TM.VAL.OTHR.ZS.WT	Computer, communications and other services (% of commercial service imports)	34.3	28.2	22%
TM.VAL.SERV.CD.WT	Commercial service imports (current US$)	31.7 Billion	8.9 Billion	256%
TM.VAL.TRVL.ZS.WT	Travel services (% of commercial service imports)	22.0	25.7	-15%
TX.VAL.TECH.CD	High-technology exports (current US$)	20.5 Billion	2.4 Billion	761%
TX.VAL.SERV.CD.WT	Commercial service exports (current US$)	32.8 Billion	9.7 Billion	237%
TX.VAL.MRCH.WL.CD	Merchandise exports by the reporting economy (current US$)	109.0 Billion	32.8 Billion	232%
TX.VAL.MRCH.CD.WT	Merchandise exports (current US$)	111.0 Billion	33.9 Billion	227%
TX.VAL.MRCH.R3.ZS	Merchandise exports to low- and middle-income economies in Latin America & the Caribbean (% of total merchandise exports)	6.3	3.2	98%
TX.VAL.MRCH.R2.ZS	Merchandise exports to low- and middle-income economies in Europe & Central Asia (% of total merchandise exports)	4.0	8.6	-53%
TX.MNF.TECH.ZS.UN	Medium and high-tech exports (% manufactured exports)	0.4	0.3	29%
TX.VAL.MRCH.R1.ZS	Merchandise exports to low- and middle-income economies in East Asia & Pacific (% of total merchandise exports)	8.7	12.2	-28%
TX.VAL.MANF.ZS.UN	Manufactures exports (% of merchandise exports)	50.1	39.9	26%
TX.VAL.MRCH.WR.ZS	Merchandise exports to low- and middle-income economies within region (% of total merchandise exports)	22.5	28.3	-20%
TX.VAL.TRVL.ZS.WT	Travel services (% of commercial service exports)	38.4	45.7	-16%
TX.VAL.MRCH.HI.ZS	Merchandise exports to high-income economies (% of	66.2	59.0	12%

	total merchandise exports)			

* Note: The following indicators were significantly different, but only at the 10% level of significance (90% level of confidence).

IP.IDS.RSCT	Industrial design applications, resident, by count
IC.REG.DURS	Time required to start a business (days)
IC.REG.DURS.FE	Time required to start a business, female (days)
IC.REG.DURS.MA	Time required to start a business, male (days)