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Human Capital Growth - with Region and Gender in Perspective

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ABSTRACT

Human Capital Growth - with Region and Gender in Perspective

Chapter 6 from the forthcoming Inclusive Wealth Report 2022 looks at human capital in greater detail, based on the latest human capital estimates from the Inclusive Wealth Report (IWR) project. In the chapter, which is repeated here, the growth of human capital and several of its constituent factors are broken down by gender and by region, and in some cases also by income, since apparently, human capital in the world is not evenly distributed across different regions or countries by income, or between educated males and females, although in almost all country cases total and per capita human capital have grown over time. The purpose is to identify the sources of human capital growth by region, gender, and various determining factors over the observed time period, 1990-2020.

JEL Classification: E24, J16, O57, E01

Keywords: human capital, country wealth, gender, analysis by regions and country income

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1. Introduction

One conclusion of the forthcoming Inclusive Wealth Report 2022 (United Nation Environment Programme, 2022) is that human capital due to education is the largest component of total wealth from 1990-2020 for the majority of the countries in the world. The change in human capital over time can deliver a crucially important indicator for policy makers to monitor a country's sustainable development path in a more efficient way. Human capital as knowledge and skills embodied in educated individuals not only brings to them current incomes, but also secures their income streams in the future.

Chapter 6 from the forthcoming report looks at human capital in greater detail, based on the latest human capital estimates from the *Inclusive Wealth Report* (IWR) project. In the chapter, which is repeated here, the growth of human capital and several of its constituent factors are broken down by gender and by region, and in some cases also by income categories, since apparently, human capital in the world is not evenly distributed across different regions or countries by income categories, or between educated males and females, although in almost all country cases total and per capita human capital have grown over time. The purpose is to identify the sources of human capital growth by region, gender, and various determining factors over the observed time period.

The time period covered by the chapter is the same as applied in this new IWR report, i.e., between 1990 and 2020. In addition to annual analysis results to be reported, period analysis and results are frequently presented in the chapter based on the chosen entire period 1990-2020, and selected three consecutive subperiods, i.e., 1990-2000, 2000-2010, and 2010-2020.

The country coverage in the chapter is slightly greater than the country coverage for all types of wealth in this IWR report.[1] This chapter covers 166 countries/economies, accounting for almost 99 percent of the world population in total. In the chapter, these 166 countries/economies are called the *World*. The World is further divided into six regions, which are linked to the World Bank country grouping. [2] A seventh category, an artificial 'region,' is formed by selecting 24 countries/economies considered *advanced* from the seven geographical regions originally defined in the World Bank grouping. This artificial region is thus titled as *Advanced Economies*. The other six regions are *East Asia & Pacific* (20 countries/economies), *Europe & Central Asia* (28 countries/economies), *Latin America & Caribbean* (27 countries/economies), *Middle East & North Africa* (18 countries/economies), *South Asia* (8 countries/economies), and *Sub-Saharan Africa* (41 countries/economies).[3]

For our purpose, the World Bank grouping by income is also applied in the chapter. With Venezuela

(Bolivian Republic of) not being labelled, the remaining 165 countries/economies are divided into four income groups: High-income (51 countries/economies), Upper-middle-income (42 countries/economies), Lower-middle-income (49 countries/economies), and Low-income (23

[1] There are three countries which have estimates for human capital, but not for all three types of wealth components. They are the Democratic People's Republic of Korea, Eswatini, and North Macedonia.
[2] See https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups
[3] For a detailed list of the countries/economies included in the seven regions, please refer to Appendix A.

countries/economies). In addition, the 165 countries/economies are named as the *World** in the chapter.[4]

The rest of the chapter is structured as follows. Section 2 presents the estimated expected years of schooling by gender and region over the period 1990-2020, given that it is the first time that *expected* rather than *actually completed* years of schooling are utilized as one essential factor in human capital estimation in the new IWR report. In Section 3, the contributions of different regions (income groups) to the World (World*) human capital growth are provided and discussed accordingly. Moreover, the country contributions to regional human capital growth over the entire period 1990-2020 are displayed for all covered regions, together with the rank change of country contribution over the three subperiods (1990-2000, 2000-2010, and 2010-2020) in each region.

In Section 4, estimated annual time series of human capital per capita by gender is first displayed by region over the entire period 1990-2020. Next, estimated Gini gender coefficients, reflecting how human capital is allocated between educated males and females, are presented both for the various regions and income groups, and for the individual countries in the four income groups. Section 5 introduces a novel decomposition method, with the view to uncover the sources of human capital growth within the IWR framework for human capital measurement. Then, the decomposition results, i.e., the detailed country contributions to regional human capital growth by gender and various factors, are reported for all covered regions, both during the entire period 1990-2020, and across the three subperiods: 1990-2000, 2000-2010, and 2010-2020. Finally, Section 6 concludes.

2. Expected years of schooling

In the new IWR report, a novel concept, i.e., 'expected years of schooling', replaces the 'years of school completed' measure that has been applied for human capital estimation in all previous IWR reports (e.g., Managi and Kumar, 2018). Expected years of schooling are estimated based on population education enrolment rate by adopting the technique of school life table (Stockwell and Nam, 1963).

Expected years of schooling are determined at the age at which an individual normally starts primary school based on enrolment and completion rates of those older who have finished their education. As such, it is *forward looking* compared to a Barro-Lee years of school currently completed measure as it considers how many years of school will eventually be completed (Barro and Lee, 2013, 2018). For example, a fifteen-year-old, who is included in the Barro-Lee data set at his/her current years of school completed, may proceed, and complete more years of education in the future.

Figure 1 presents the average expected years of schooling by gender at every five years over the period 1990-2020 for the World and the seven regions. The region (or World) average is a weighted average of country expected years of schooling by using the number of individuals from age 0 to 4 in each constituent country in a region (or World) as the weight.[5]

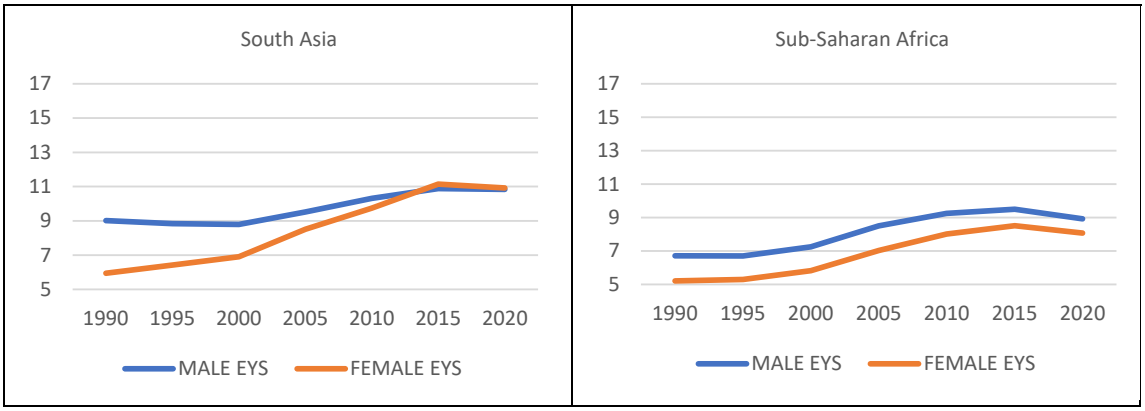
By 2020, the average female expected years of schooling in the World were equal to those of males,

[4] For a detailed list of the countries/economies included in the four income groups, please see Appendix B.
[5] The population data for those aged 0-4 comes from the United Nations, Department of Economic and Social Affairs, Population Division (2019), World Population Prospects 2019, Online Edition. Rev. 1.

increasing by 1.5 years from their starting point of 8.1 in 1990. Without exception, the average expected years of schooling of both females and males by region increased between 1990 and 2020.

By 2020, except for Middle East & North Africa and Sub-Saharan Africa, the average female expected years of schooling were greater than their male counterparts. In 2020, the highest average expected years of schooling for both males and females were for Advanced Economies (16.0 and 16.8 for males and females, respectively); while the lowest were for Sub-Saharan Africa (8.9 and 8.1 for males and females, respectively), which had been experiencing the largest total population growth and includes two-thirds of the covered Low-income countries.

Figure 1. Expected years of schooling (EYS) by gender, every five years, 1990-2020



Source: Authors' own calculations.

The average female expected years of schooling for all but Advanced Economies and Europe & Central Asia increased by over 50 percent between 1990 and 2020. The largest 1990 to 2020 percentage increase in the average female expected years of schooling was for South Asia at 83.8 percent (from 5.9 in 1990 to 10.9 in 2020); while that in the average male expected years of schooling was for Latin America & Caribbean at 50.4 percent (from 9.3 in 1990 to 13.9 in 2020).

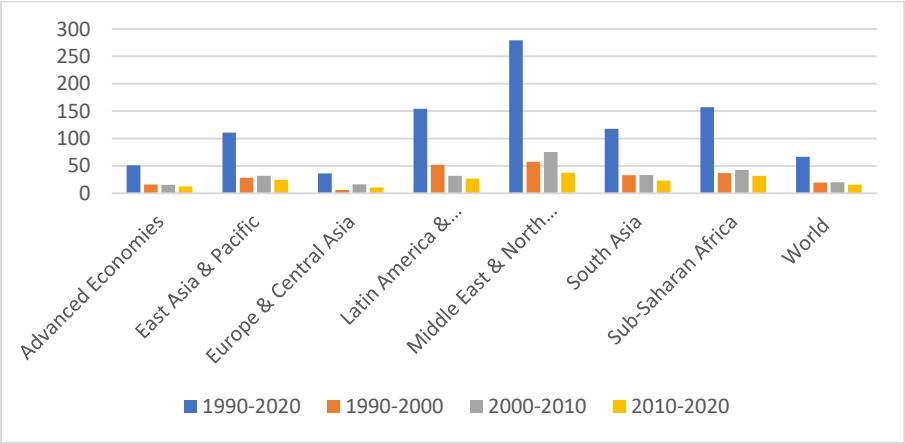
In every five-year period, the average female expected years of schooling were above or about equal to those for males for Advanced Economies, Europe & Central Asia, and Latin America & Caribbean. The only region for which there was a crossing point for the average expected years of schooling of males and females was East Asia & Pacific (in 2010). Future expected increases in education of the young are a precursor of future growth in human capital of any country.

3. Human capital growth

3.1 Regional (income group) contribution to human capital growth

Over the period 1990-2020, the total World human capital had increased 66.4 %, from almost 332 trillion in 1990 to over 552 trillion in 2020, both measured in 2015 US$. This increase is equivalent to an annualized average growth rate of 1.7 % over 30 years.

Figure 2. Growth of human capital (%), by region

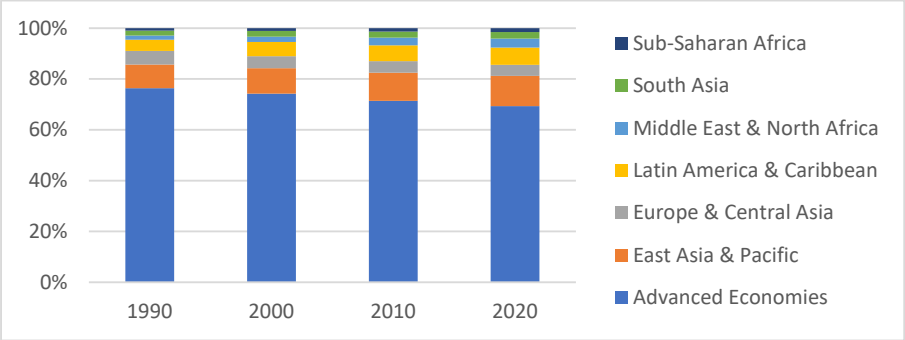


Source: Authors' own calculations.

As shown in Figure 2, the growth of human capital varied across different regions. For the entire period 1990-2020, the region of Middle East & North Africa enjoyed the highest growth, while Europe & Central Asia got the lowest one. In fact, only two of the seven regions (i.e., Advanced Economies and Europe & Central Asia) had lower growth than that in the World in its entirety, and this was true not only for the whole period 1990-2020, but also for the three selected subperiods (1990-2000, 2000-2010, and 2010-2020) as well.

Considering the three subperiods, for the World as a whole, the growth during the 2000-2010 was the highest, followed by that in 1990-2000, and then by that in 2010-2020. This was also the case for East Asia & Pacific, Middle East & North Africa, South Asia, and Sub-Saharan Africa. On the other hand, Advanced Economies and Latin America & Caribbean revealed a continuously decreasing growth over the three subperiods, while Europe & Central Asia enjoyed its highest growth during the 2000-2010 subperiod, however, with that in 1990-2000 being the lowest. The not-so-good message delivered is that the human capital growth in all regions in the World decreased in the last observed subperiod 2010-2020, if compared with those in the previous subperiod 2000-2010.

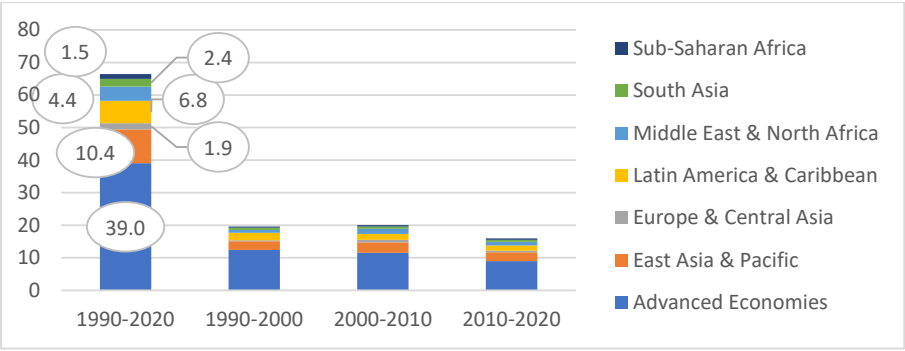
Figure 3. Share of human capital in the World, by region (%)



Source: Authors' own calculations.

The impact of a specific region on the World human capital growth does not only depend on its own growth, but also on its share in the total World human capital stock. Figure 3 presents the share of human capital by region in 1990, 2000, 2010, and 2020. Although the share of Advanced Economies had monotonically decreased over the observed four years, it still accounted for more than two thirds of the World human capital in 2020. Europe & Central Asia surrendered the third place in ranking to Latin America & Caribbean already in 2000 due to its continuously decreased share. On the other hand, the other five regions had enjoyed a constantly increased share over the same four observed years.

Figure 4. Contribution to the World human capital growth, by region (%)

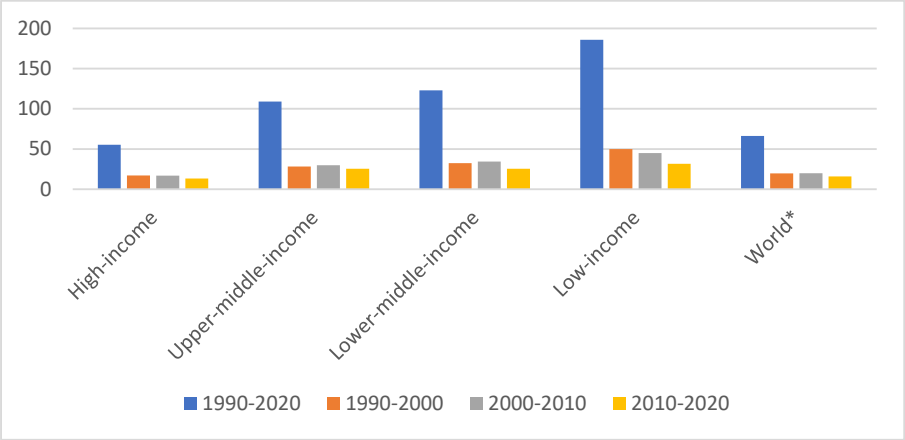


Source: Authors' own calculations.

Figure 4 demonstrates the regional contribution to the World human capital growth which results from the combination of information in Figures 2 and 3. As shown, over the entire period 1990-2020, Advanced Economies and East Asia & Pacific together accounted for almost three quarters of the World human capital growth. The rest one quarter was shared by the other five regions, with Latin America & Caribbean having the largest share among them.

The patterns of regional contribution over the subperiods 1990-2000, 2000-2010, and 2010-2020 as shown in Figure 4 are closely in line with those as revealed in Figure 2 for regional growth of human capital. For example, regional contributions declined across all regions in the last subperiod 2010-2020, if compared to those in the subperiod 2000-2010.

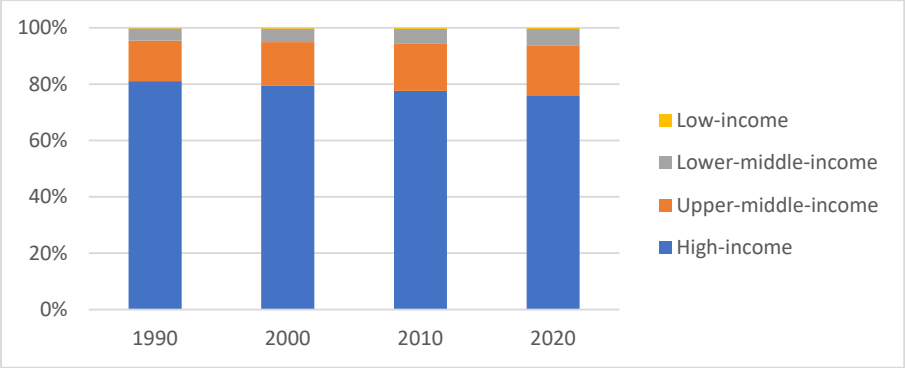
Figure 5. Growth of human capital (%), by income group



Source: Authors' own calculations.
Note: World* does not include Venezuela (Bolivarian Republic of).

Instead of dividing the covered countries into regions, the countries can be classified into different income groups. Figure 5 shows human capital growth by income group over the observed periods. Among the four income groups, only High-income group had lower growth than that in the World*, both for the entire period 1990-2020, and for the three subperiods as well. It seems that the lower the income in a group was, the higher the human capital growth, and it was true for all three selected subperiods. High growth, from whatever income group, is favorable for human capital development in the World. However, as shown in Figure 5, all income groups suffered a decline in growth in the last subperiod 2010-2020.

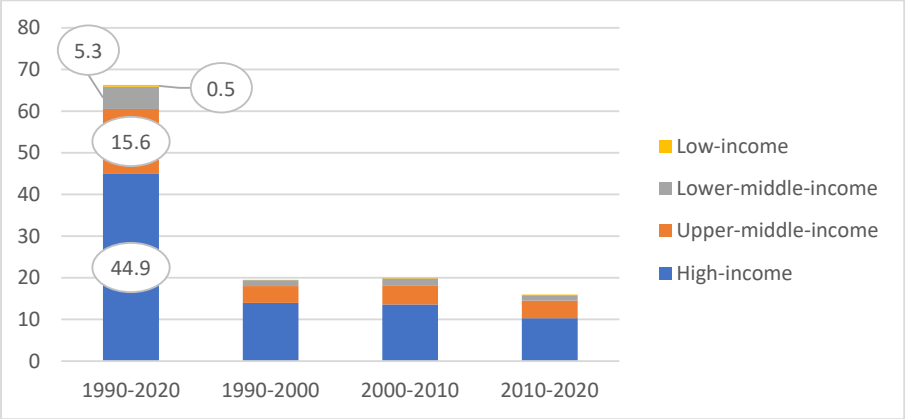
Figure 6. Share of human capital in the World*, by income group (%)



Source: Authors' own calculations.

In terms of the human capital share by income group, Figure 6 shows that the share of High-income group was dominant among the four income groups, despite a continuous decrease over the four observed years. The shares of all the other three income groups had increased constantly over the same period. Not surprising, the higher income a group had, the more human capital it would possess.

Figure 7. Contribution to the World* human capital growth, by income group (%)



Source: Authors' own calculations.

Figure 7 reports the contribution from different income groups to the World* human capital growth over the observed periods. Although dominant, the contribution of High-income group had continuously decreased over the three subperiods. The contribution change among the three subperiods for other income groups were small, moreover, all income groups suffered a decline of contribution in the last subperiod 2010-2020.

3.2 Country contribution to regional human capital growth

Each covered region in the chapter consists of a number of countries/economies and their performance in terms of contribution to the regional human capital growth is expected to vary, depending on their share in regional human capital stock and also on their growth achievement over the observed periods, exactly as discussed above regarding the regional contribution to the World human capital growth.

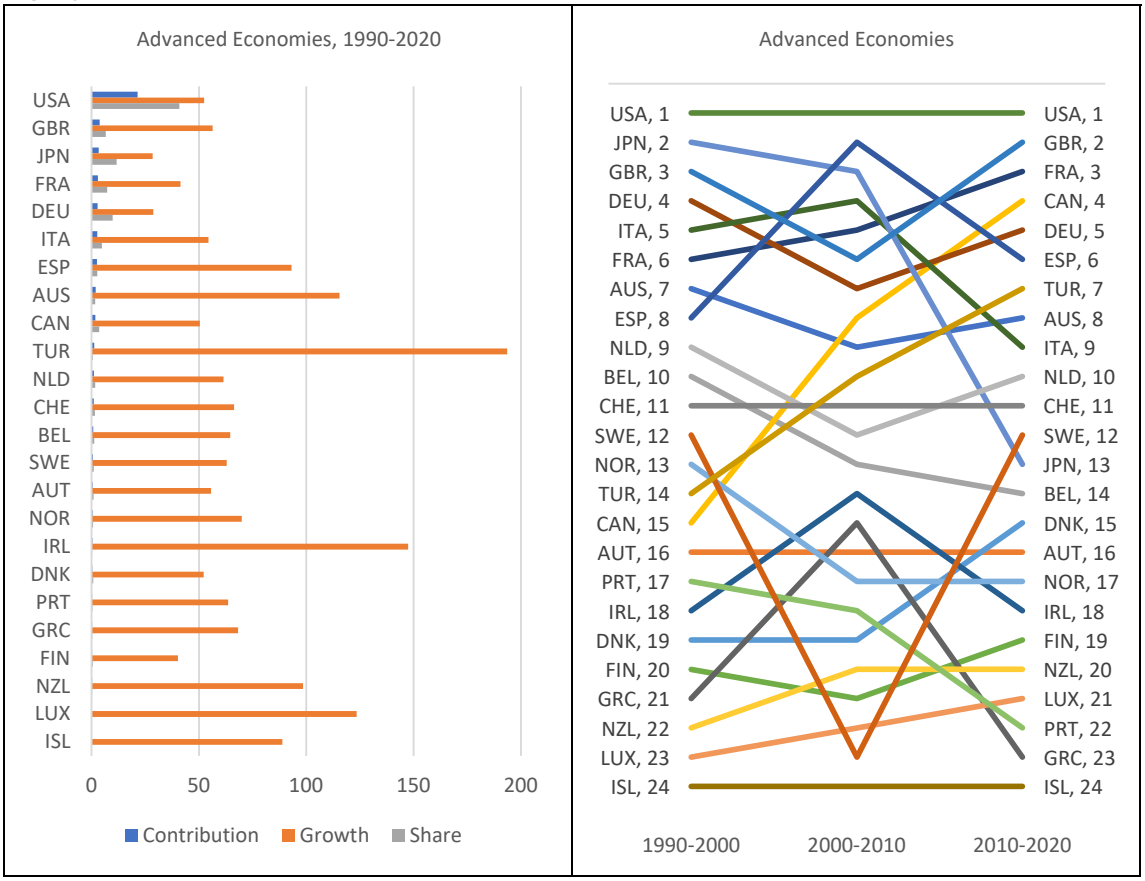
In this subsection, a two-panel Figure will be presented for each region. The left panel presents the country share and growth of human capital and the corresponding contribution to the regional human capital growth over the entire period 1990-2020. The constituent countries in the region in concern are ranked by their contributions in descending order from top to bottom in the left panel. The right panel displays the rank change of the country contribution to the regional human capital growth in the same region over the three selected subperiods: 1990-2000, 2000-2010, and 2010-2020.

Advanced Economies

The regional human capital growth in Advanced Economies was 51.2 % over the entire period 1990-2020, which was the second lowest among all regions. As shown in Figure 8, the top ten countries in

terms of contribution in this region were G7 countries, i.e., the United States of America (USA), the United Kingdom of Great Britain and Northern Ireland (GBR), Japan (JPN), France (FRA), Germany (DEU), Italy (ITA), and Canada (CAN), plus Spain (ESP), Australia (AUS), and Turkey (TUR). Given the large share of human capital for G7 countries in the region, their contributions were quite high, even if their growth of human capital were not among the top.

Figure 8. Country contribution to regional human capital growth (left panel, %) and rank change (right panel), Advanced Economies



Source: Authors' own calculations.

On the other hand, Spain (ESP), Australia (AUS), and Turkey (TUR) enjoyed an above-average growth in the region over the period 1990-2020. In fact, compared to 1990 level, Turkey had almost tripled its human capital in 2020, the highest growth in the whole region.

As shown in the right panel in Figure 8, both the top (United States of America (USA)) and bottom (Iceland (ISL)) countries were quite stable across the three subperiods. However, there were some interesting changes occurred among the other countries in the region. For instance, Canada (CAN) and Turkey (TUR) were not among the top ten countries during the first subperiod 1990-2000, but both joined the top ten club already during the second subperiod 2000-2010, and finally ended at the fourth and seventh place during the last subperiod 2010-2020, respectively.

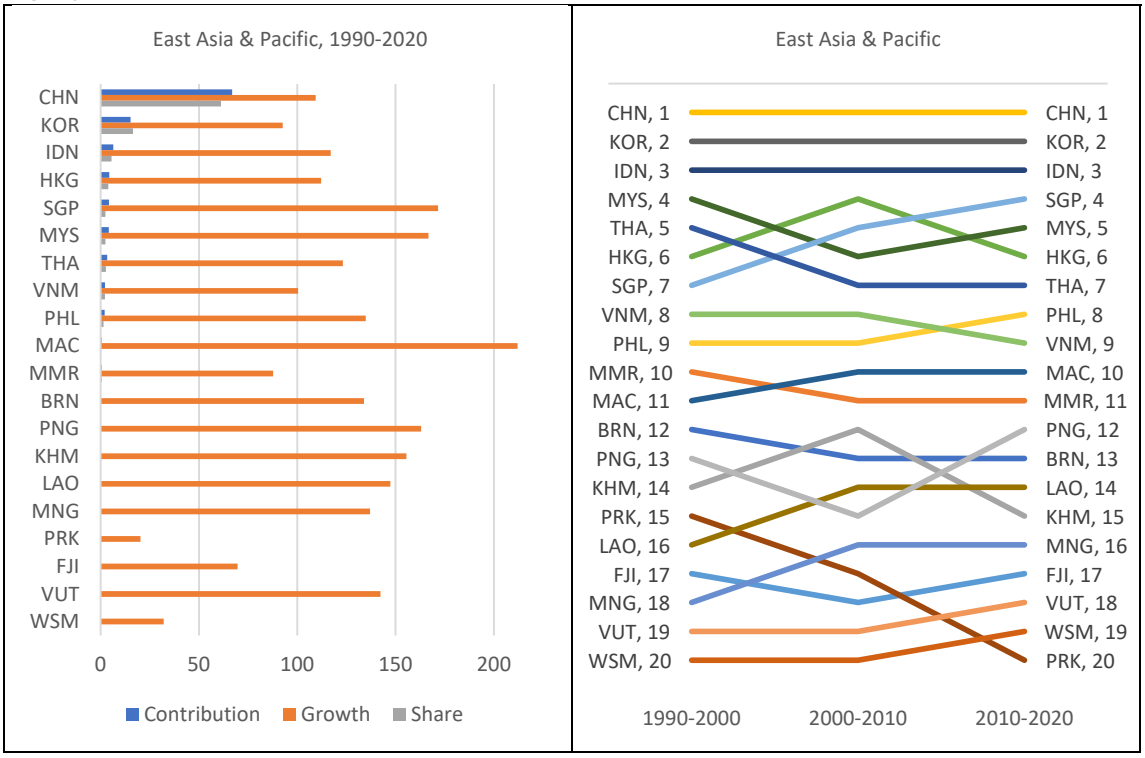
On the contrary, Japan (JPN) started with the second place during 1990-2000, but fell to the third place during 2000-2010, and further down to the 13th place during 2010-2020. There were also ups and downs for some other countries. For instance, Sweden (SWE) started at the 12th place and plunged to the second lowest place (23rd), and finally climbed back to the 12th place in the region. All

these observations serve as reminding signal, necessitating further investigations into individual countries in concern.

East Asia & Pacific

Over the period 1990-2020, the regional human capital growth in East Asia & Pacific was 110.7 %. As shown in the left panel of Figure 9, due to its sheer size, China (CHN) dominated in this region, accounting for about 60 percent of the regional growth alone. Over the entire period 1990-2020, three of the so-called 'Four little dragons' were among the top 5 countries, i.e., South Korea (KOR) at the 2nd place, Hong Kong (HKG) at the 4th place, and Singapore (SGP) at the 5th place. Indonesia (IDN), with a large share of human capital, was at the 3rd place in the region.

Figure 9. Country contribution to regional human capital growth (left panel, %) and rank change (right panel), East Asia & Pacific



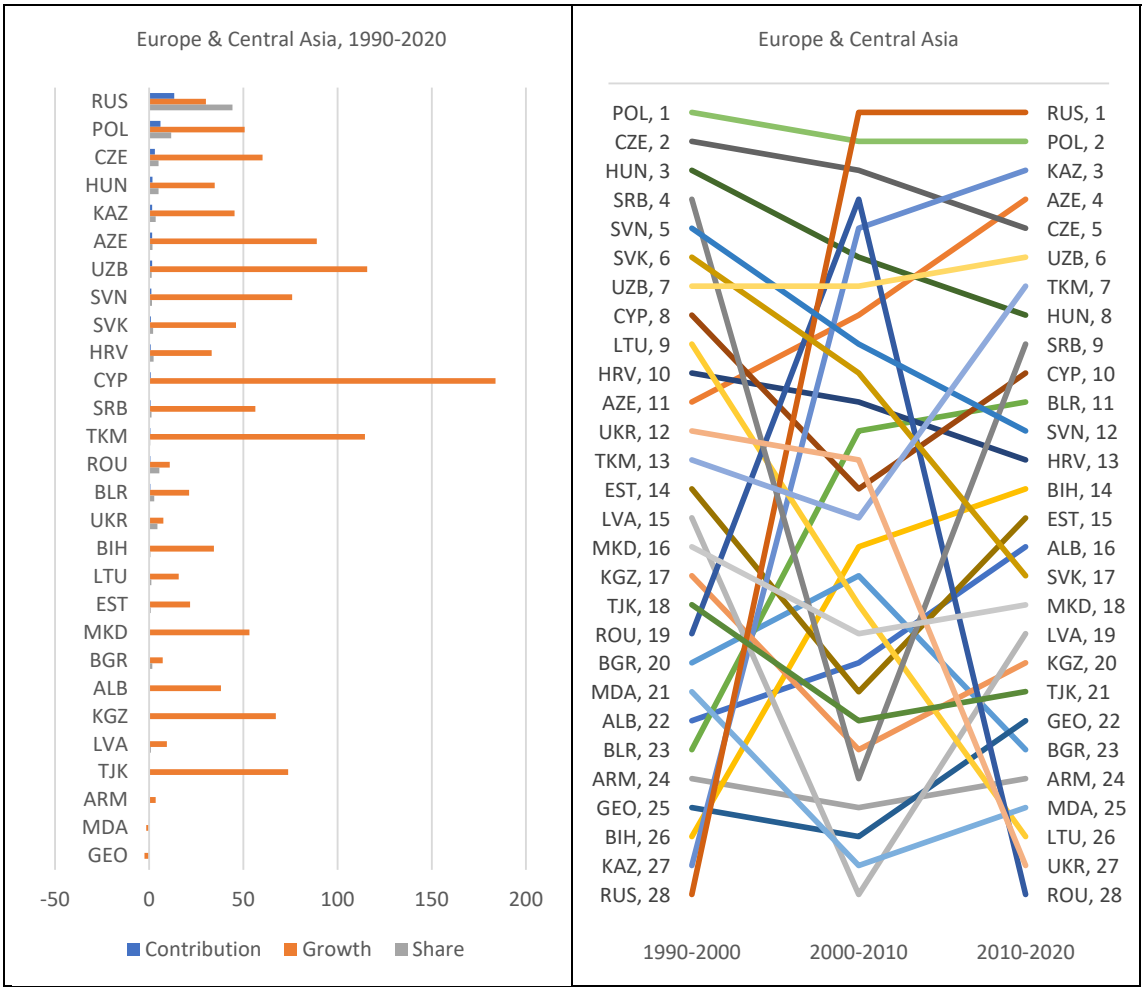
Source: Authors' own calculations.

The right panel of Figure 9 shows that most of the countries in this region had relatively small rank change over the three subperiods. For example, the ranking of the first top 3 countries (China (CHN), South Korea (KOR), and Indonesia (IDN)) had never changed. However, there were a few exceptions. The first one is that Singapore (SGP) started at 7th place and gradually climbed up into the top 5 during the last subperiod. The second exception is that over the three subperiods, Democratic People's Republic of Korea (PRK) fell all the way down from the 15th place at the beginning to the bottom (the 20th) place in the end.

Europe & Central Asia

The regional human capital growth in Europe & Central Asia was 36.3 % over the period 1990-2020, which was the lowest among all regions. With the largest share of human capital in this region, Russian Federation (RUS) contributed most to the regional human capital growth, despite a moderate growth of human capital by its own over the period 1990-2020. Poland (POL) occupied the 2nd place in terms of contribution, and its share of human capital was also at the 2nd place in the region. In fact, the top 5 countries in terms of contribution all had human capital share among the highest in the region, they are Russian Federation (RUS), Poland (POL), Czechia (CZE), Hungary (HUN), and Kazakhstan (KAZ). Two countries, Romania (ROU) and Ukraine (UKR), however, though having high human capital share, ended up at the 28th and the 27th place respectively among the 28 countries, because of very low growth of human capital in the region.

Figure 10. Country contribution to regional human capital growth (left panel, %) and rank change (right panel), Europe & Central Asia



Source: Authors' own calculations.

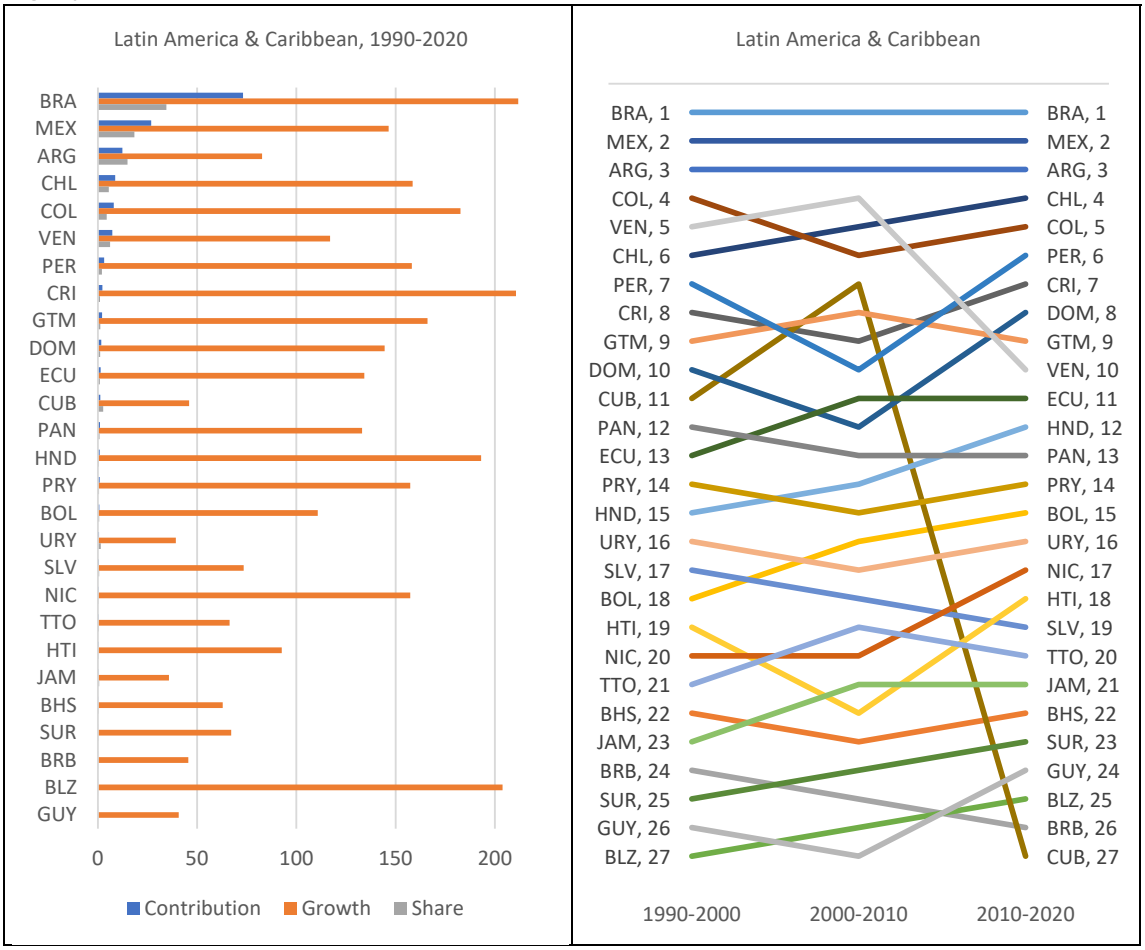
Some interesting observations can be drawn by looking at the right panel of Figure 10. Although Poland (POL) and Czechia (CZE) were always among the top 5 countries across the three subperiods, it was not the case for Russian Federation (RUS) and Kazakhstan (KAZ). The two countries, ranked at the bottom during the first subperiod 1990-2000, leaped up abruptly to the top 5 club already during the second subperiod 2000-2010.

Compared to other regions, there were many ups and downs occurred in terms of country ranking in this region. For example, starting from the 3rd place at the beginning, Hungary (HUN) ended up at the 8th place during the last subperiod 2010-2020. Ukraine (UKR) set off at the 12th place and ended up at the 27th place, while Romania (ROU) once climbed up to the 4th place during the second subperiod from the 19th place at the beginning, but finally plummeted to the bottom during the last subperiod 2000-2020.

Latin America & Caribbean

The regional human capital growth in Latin America & Caribbean was 154.2 % over the period 1990-2020. In this region, Brazil (BRA) was dominant, accounting for almost half of the regional human capital growth. In particular, over the period 1990-2020, it had not only the highest human capital share in this region, but also the highest growth of human capital, with its human capital more than tripled in 2020 compared to that in 1990.

Figure 11. Country contribution to regional human capital growth (left panel, %) and rank change (right panel), Latin America & Caribbean



Source: Authors' own calculations.

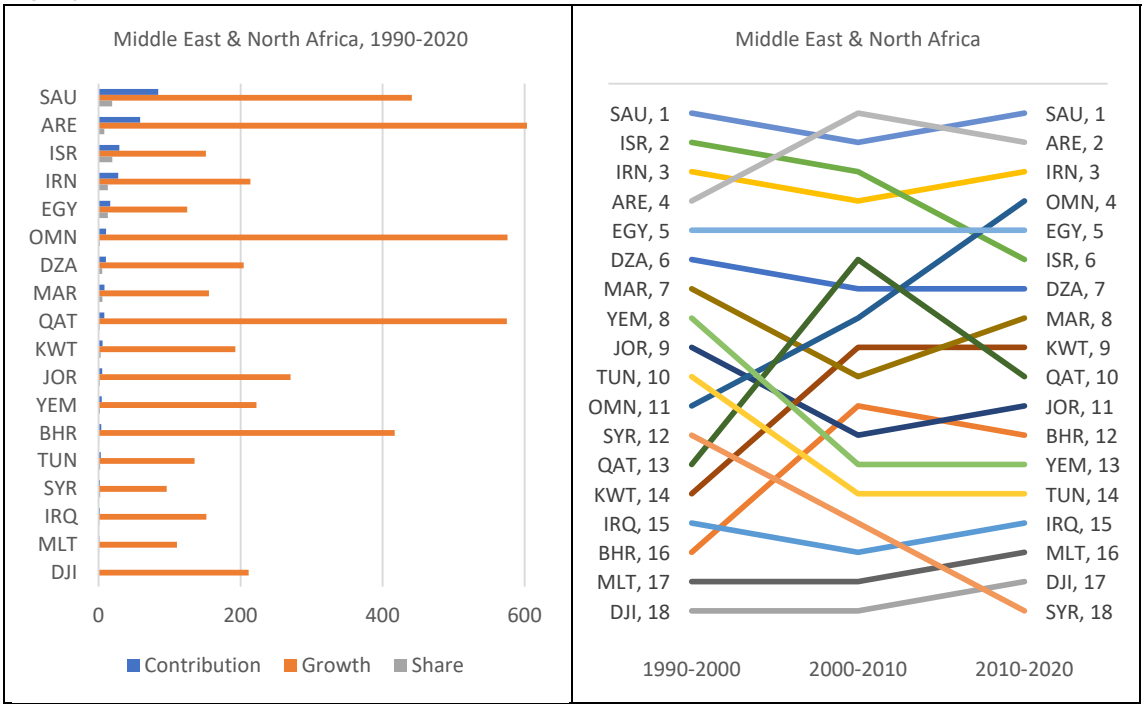
The top 6 countries in terms of contribution had the top 6 human capital share in this region, they are Brazil (BRA), Mexico (MEX), Argentine (ARG), Chile (CHL), Colombia (COL), and Venezuela (VEN).

As displayed by the right panel of Figure 11, the rank change in terms of country contribution was relatively small (not more than 3 ranks) for most of the countries in this region over the three subperiods. For example, the ranking of the top 3 countries had never changed. However, there were a few exceptions. Venezuela (VEN) achieved one step up to the 4th place during the second subperiod 2000-2010 from the 5th place at the beginning, but finally stepped back to the 10th place during the last subperiod 2010-2020. Similarly, Cuba (CUB) entered into the top 10 club during the second subperiod 2000-2010 from the 11th place during the first subperiod 1990-2000 but dramatically fell down to the bottom of the region during the last subperiod 2010-2020.

Middle East & North Africa

The regional human capital growth in Middle East & North Africa was 279.3 % over the period 1990-2020, which was the highest among all regions. In terms of the country contribution to the regional human capital growth, the top 5 countries in this region were, in descending order, Saudi Arabia (SAU), United Arab Emirates (ARE), Israel (ISR), Islamic Republic of Iran (IRN), and Egypt (EGY). In total, they accounted for about 77 percent of the regional human capital growth over the entire period 1990-2020.

Figure 12. Country contribution to regional human capital growth (left panel, %) and rank change (right panel), Middle East & North Africa



Source: Authors' own calculations.

As shown by the right panel of Figure 12, the ranking of the country contribution of the top 5 countries was in general relatively stable, with two exceptions that Israel (ISR) went down from the 2nd place at the beginning to the 6th place in the end, and United Arab Emirates (ARE) climbed up to the 2nd place during the last subperiod 2010-2020 from the 4th place at the start.

There were also bumps of ranking for other countries in this region. For instance, Oman (OMN) jumped all the way up to the 4th place in the end from the 11th place during the first subperiod 1990-

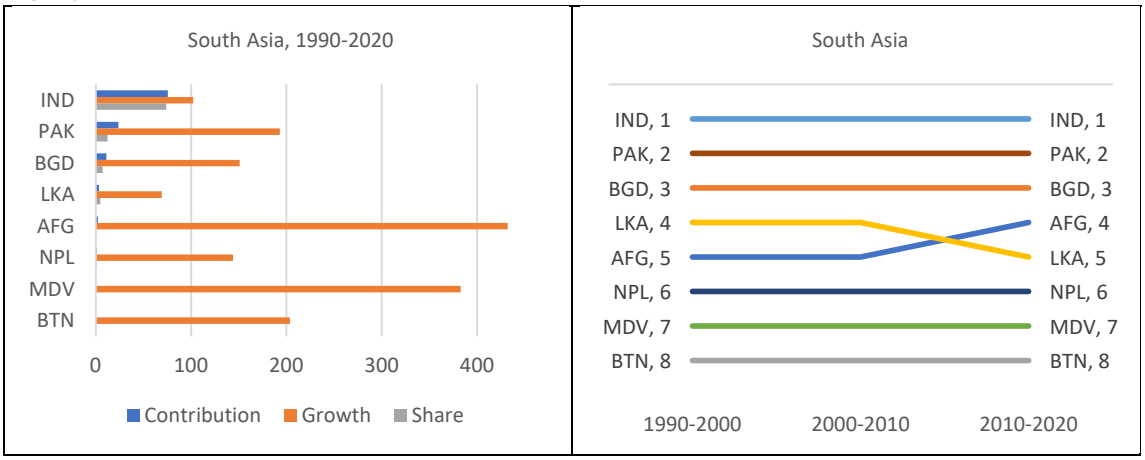
2000. On the contrary, Syrian Arab Republic (SYR) fell from the 12th place at the start to the bottom of the region in the end.

South Asia

The regional human capital growth in South Asia was 118.0 % over the period 1990-2020. No doubt, India (IND) was dominant, accounting for almost three quarters of total human capital stock in this region. Therefore, even if India's human capital growth was the second lowest in the region, its contribution to the regional human capital growth was still the highest, accounting for around 64 percent of the total regional growth.

Among the total eight countries in this region, the top three counties in terms of the country contribution are India (IND), Pakistan (PAK), and Bangladesh (BGD), together accounting for about 94 percent of the regional human capital growth over the entire period 1990-2020.

Figure 13. Country contribution to regional human capital growth (left panel, %) and rank change (right panel), South Asia



Source: Authors' own calculations.

As displayed by the right panel of Figure 13, the ranking of the country contribution in this region was rather stable. There was only a slight change between Sri Lanka (LKA) and Afghanistan (AFG) during the last subperiod 2010-2020, when their ranks interchanged.

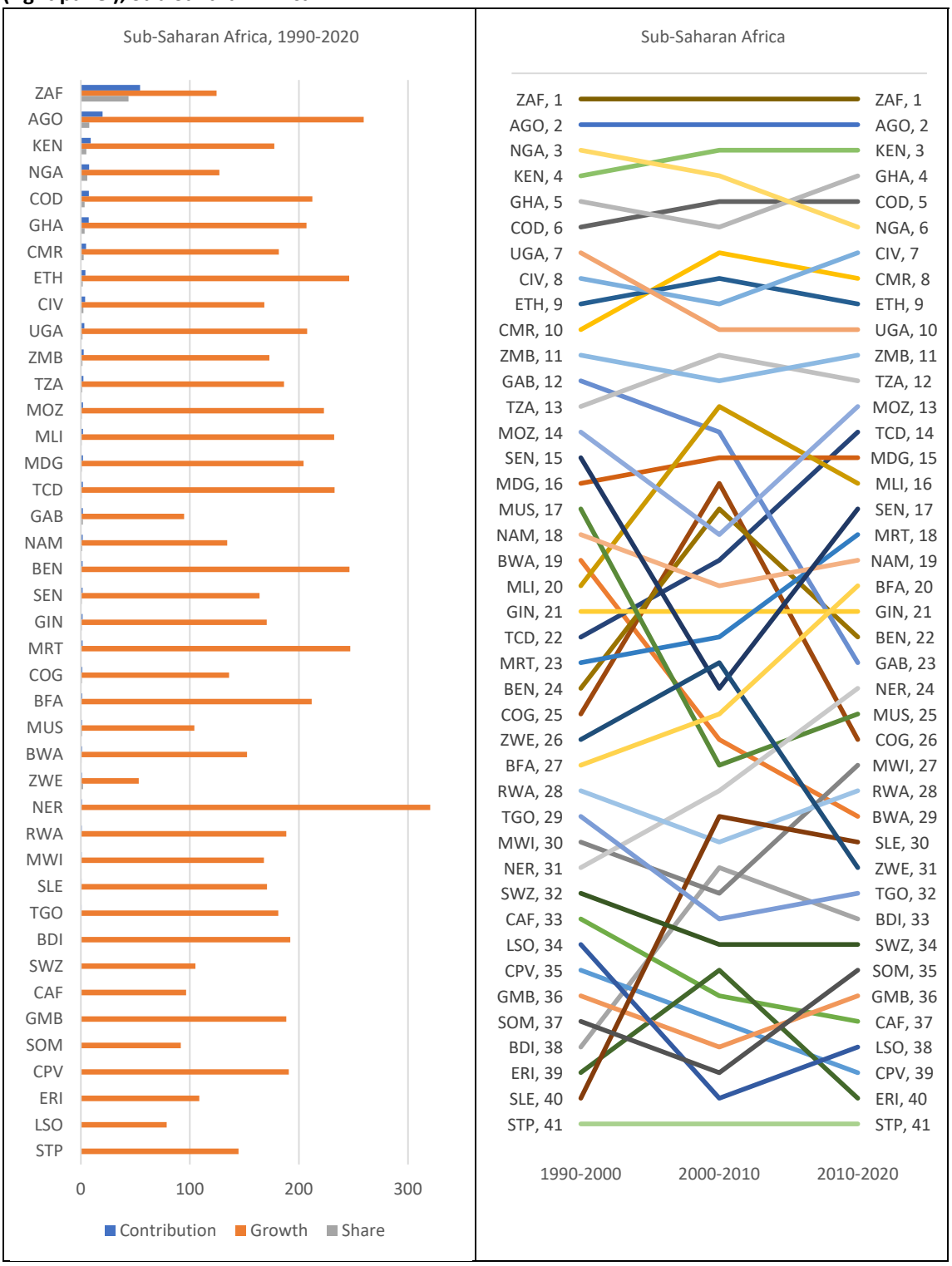
Sub-Saharan Africa

The regional human capital growth in Sub-Saharan Africa was 157.2 % over the period 1990-2020, which was the second largest among all regions. As shown in the left panel of Figure 14, in terms of the country contribution, the top six countries are, in descending order, South Africa (ZAF), Angola (AGO), Kenya (KEN), Nigeria (NGA), Democratic Republic of the Congo (COD), and Ghana (GHA), together accounting for around 67 percent of the regional human capital growth. The six countries also had the highest human capital share, accounting for almost 70 percent in total in the region over the entire period 1990-2020.

The right panel of Figure 14 shows that in general the ranking of the country contribution among the top ten countries were relatively stable across the three subperiods. However, there were many ups

and downs among the other countries over the same periods. For instance, Botswana (BWA) started from the 19th place during the first subperiod and fell all the way down to the 29th place in the end. Gabon (GAB) plummeted from the 12th place at the start down to the 23rd place in the end.

Figure 14. Country contribution to regional human capital growth (left panel, %) and rank change (right panel), Sub-Saharan Africa



Source: Authors' own calculations.

In contrast, Sierra Leone (SLE) set off at the second lowest place (40th) at the beginning, during the last subperiod 2010-2020, it ended up at the 30th place in the region. Similarly, both Burkina Faso (BFA) and Chad (TCD) increased their ranks substantially over the three subperiods and were at the 20th place (from the 27th place at the beginning) and the 14th place (from the 22nd place at the beginning) in the end in the region, respectively.

As a matter of fact, all the observations drawn from the Figures as presented in this subsection serve well as reminding signal, necessitating further investigations into individual countries as regards which and when things happened in the countries in concern.

4. Human capital by gender

4.1 Human capital per capita by gender

Human capital per capita, as a headline indicator, is calculated as human capital divided by the total population, including both educated and new births. Table 1 presents the regional share of the total World population by males, females, and both gender in 1990 and 2020.

Table 1. Share of total population in the World, by region and gender (%)

Region	Male		Female		Total		Number of countries/economies
	1990	2020	1990	2020	1990	2020	
Advanced Economies	15.8	13.2	16.7	13.8	16.2	13.5	24
East Asia & Pacific	32.6	28.9	31.9	28.5	32.3	28.7	20
Europe & Central Asia	7.4	5.1	8.2	5.7	7.8	5.4	28
Latin America & Caribbean	8.2	8.2	8.4	8.7	8.3	8.5	27
Middle East & North Africa	4.7	6.0	4.6	5.6	4.7	5.8	18
South Asia	22.2	24.8	20.9	23.6	21.6	24.2	8
Sub-Saharan Africa	9.0	13.8	9.2	14.1	9.1	14.0	41
World	100	100	100	100	100	100	166

Source: Authors' own calculations.

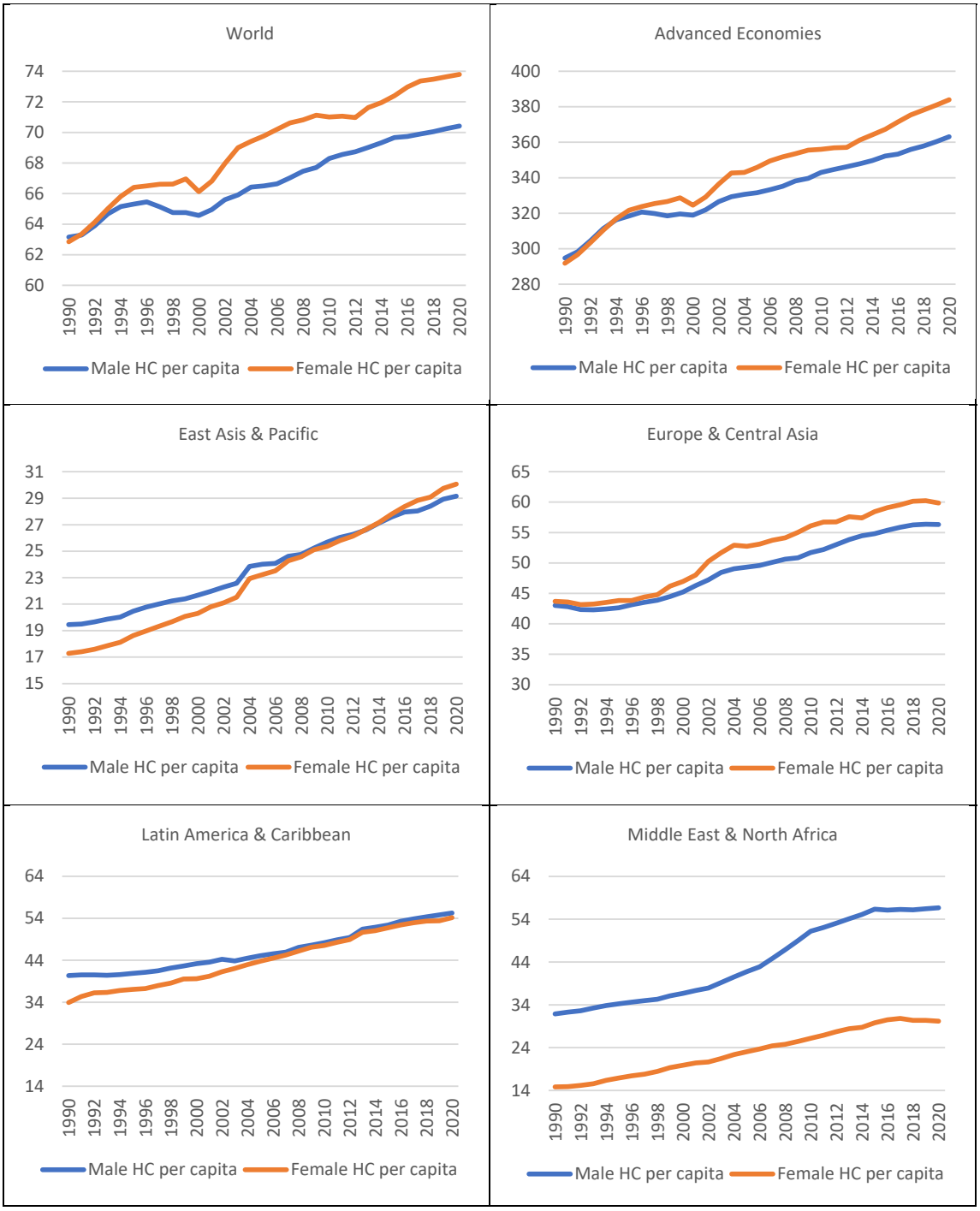
Between 1990 and 2020, the population shares of Advanced Economies, East Asia & Pacific, and Europe & Central Asia declined, while those of the other regions increased. The largest increase was for Sub-Saharan Africa (from 9.1 % to 14.0 %); the largest decrease was for East Asia & Pacific (from 32.3 % to 28.7 %). The largest share change for either males or females was an increase for Sub-Saharan Africa. The largest difference in population shares by gender was for South Asia, where males had a higher share than females, followed by Advanced Economies, where males had a lower share than females.

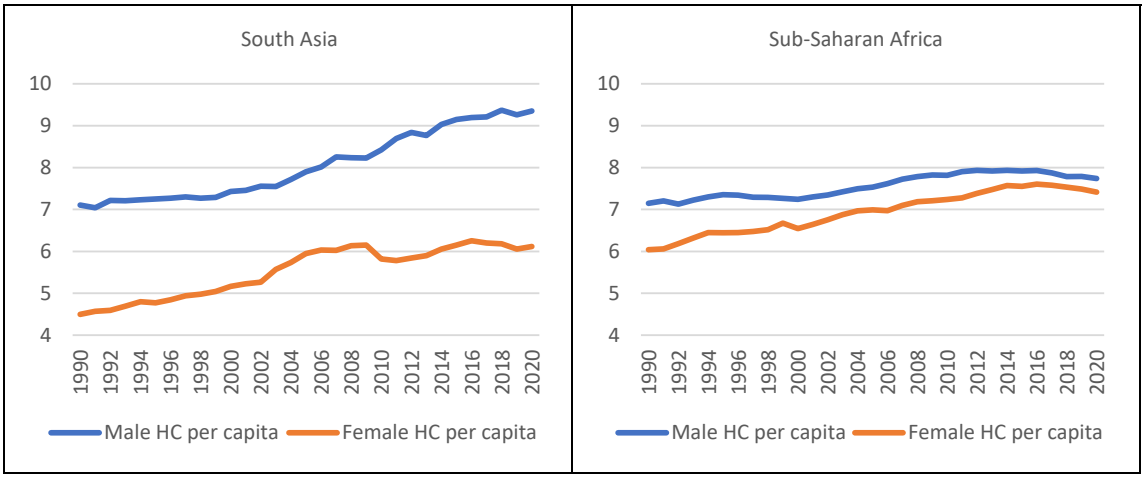
The overall population shares for Latin America & Caribbean stayed almost constant between 1990 and 2020. East Asia & Pacific had the largest population share followed by South Asia; however, the former's share was declining (from 32.3 % to 28.7 %) and the latter's share was increasing (from 21.6 % to 24.2 %) over the period 1990-2020.

Figure 15 presents the annual time series of calculated human capital per capita by region and gender over the period 1990-2020. In all the selected regions, both male and female human capital per capita had increased, though to varied extent across the regions and by gender, between 1990 and 2020. For the World as a whole, except in the first couple of years, female human capital per capita was greater than their male counterpart, however the result for the World was largely driven by human capital per capita in Advanced Economies, which was almost 300 thousand in 1990 and

over 380 thousand by 2020 (in 2015 US$). In contrast, the calculated human capital per capita of any other region was less than 100 thousand (in 2015 US$). The trend in Advanced Economies was clearly reflected in the World trend.

Figure 15. Human capital per capita by gender and region, 1990-2020 (thousands, 2015 US$)





Source: Authors' own calculations.

Besides Advanced Economies, Europe & Central Asia was the only other region for which female human capital per capita was almost always greater than that for males. With Advanced Economies excluded, Europe & Central Asia had in general the highest human capital per capita for both males and females over time, followed by Latin America & Caribbean, with the exception that male human capital per capita in Middle East & North Africa had been larger than that in Latin America & Caribbean since 2009.

In East Asia & Pacific, female human capital per capita had been lower than that for males until 2013, and since then the opposite was true. Human capital per capita was very low in South Asia and Sub-Saharan Africa, being always below 10 thousand (in 2015 US$); these two regions, together with Latin America & Caribbean and Middle East & North Africa, were the four regions for which male human capital per capita always exceeded that for females.

4.2 Gini gender coefficient

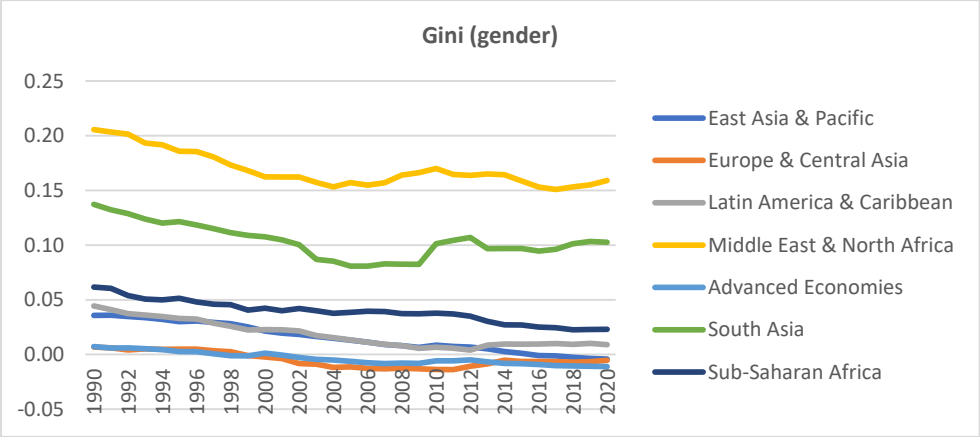
Since human capital due to education consists of knowledge and skills embodied in educated individuals, another way to address human capital by gender issue is to focus on gender distribution of developed human capital among educated population, which is defined as educated individuals aged 5 or older in the new IWR report and is a part of the total population. The total population was used for measuring human capital per capita in subsection 4.1, while the educated individuals constitute an essential factor for human capital estimation in the IWR report.

To explore human capital gender distribution among educated individuals, a Gini gender coefficient is calculated in the chapter. A positive value of an estimated Gini gender coefficient indicates that educated males generate/own more human capital than educated females, while a negative value suggests the opposite. The larger the absolute value is, the more uneven human capital is distributed between gender, and a value of zero implies that human capital is equally distributed among educated males and females.

Figure 16 displays the annual time series of estimated Gini gender coefficients over the period 1990-2020 for the seven regions. Clearly, over all the observed years, Middle East & North Africa had the highest value of Gini coefficients, followed by South Asia, and then by Sub-Saharan Africa. The first two regions had higher values than all the other regions with a large margin. Compared to the other

regions, educated males in these three regions generated/owned more human capital than educated females over the period 1990-2020.

Figure 16. Gini gender coefficients over the period 1990-2020, by region

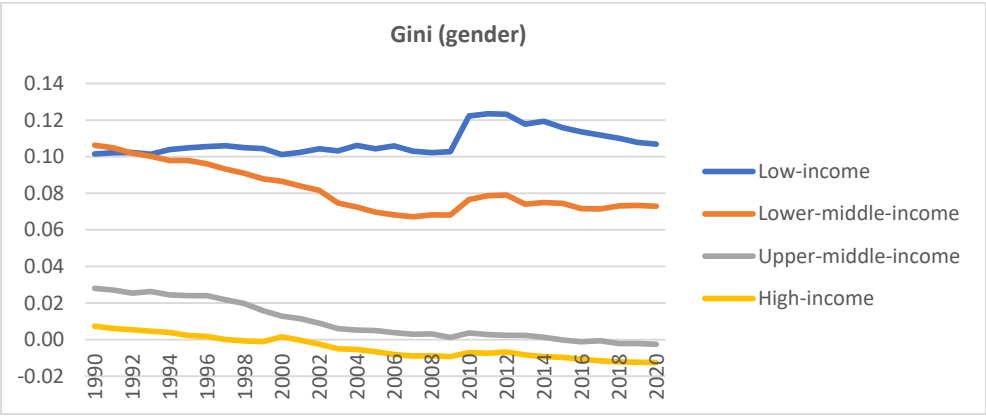


Source: Authors' own calculations.

The annual time series for Latin America & Caribbean and East Asia & Pacific had been intertwined until around 2012, since when the Gini coefficients for the former had become visibly larger than for the latter. In general, the Gini coefficients for these two regions were larger than those for Advanced Economies and Europe & Central Asia, and educated males generated/owned more human capital than their female counterparts in Latin America & Caribbean and East Asia & Pacific over most of the observed period 1990-2020. The differences of the Gini coefficients between Advanced Economies and Europe & Central Asia were not easily discernible for some years either. Around the end of 1990s, the Gini coefficients for the two regions became negative, implying that more human capital were developed/owned by educated females than their male counterparts during the period with negative values of the estimated Gini coefficients.

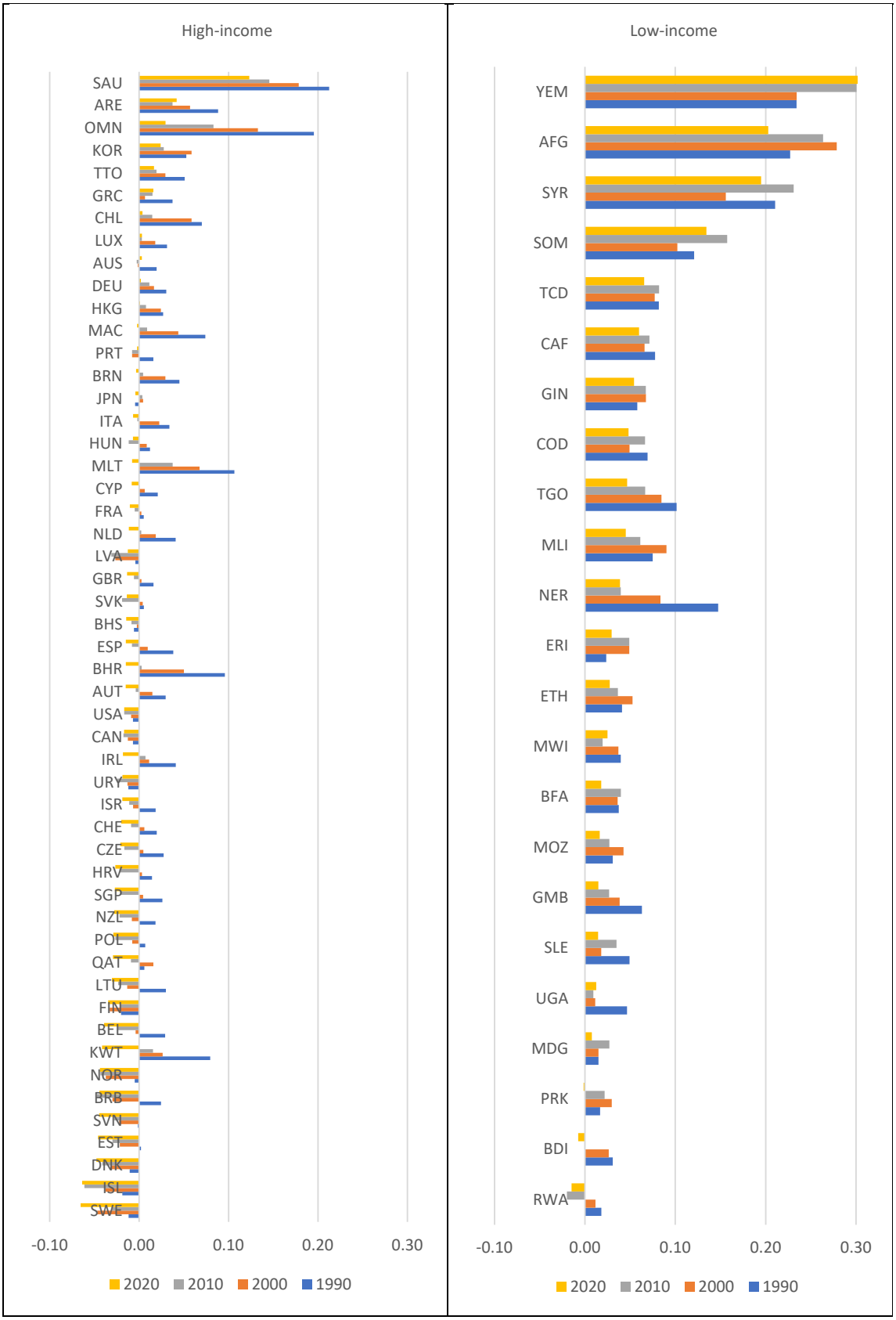
Figure 16 also reveals a general downward trend of the Gini coefficients for all regions, meaning that the distribution of human capital between educated males and females had become evener over time in the regions. However, a jump-up occurred around 2008 which had levelled up the course to varied extent for different regions, presumably due to the severe 'global financial crisis of 2007-2008' that broke out worldwide.

Figure 17. Gini gender coefficients over the period 1990-2020, by income group



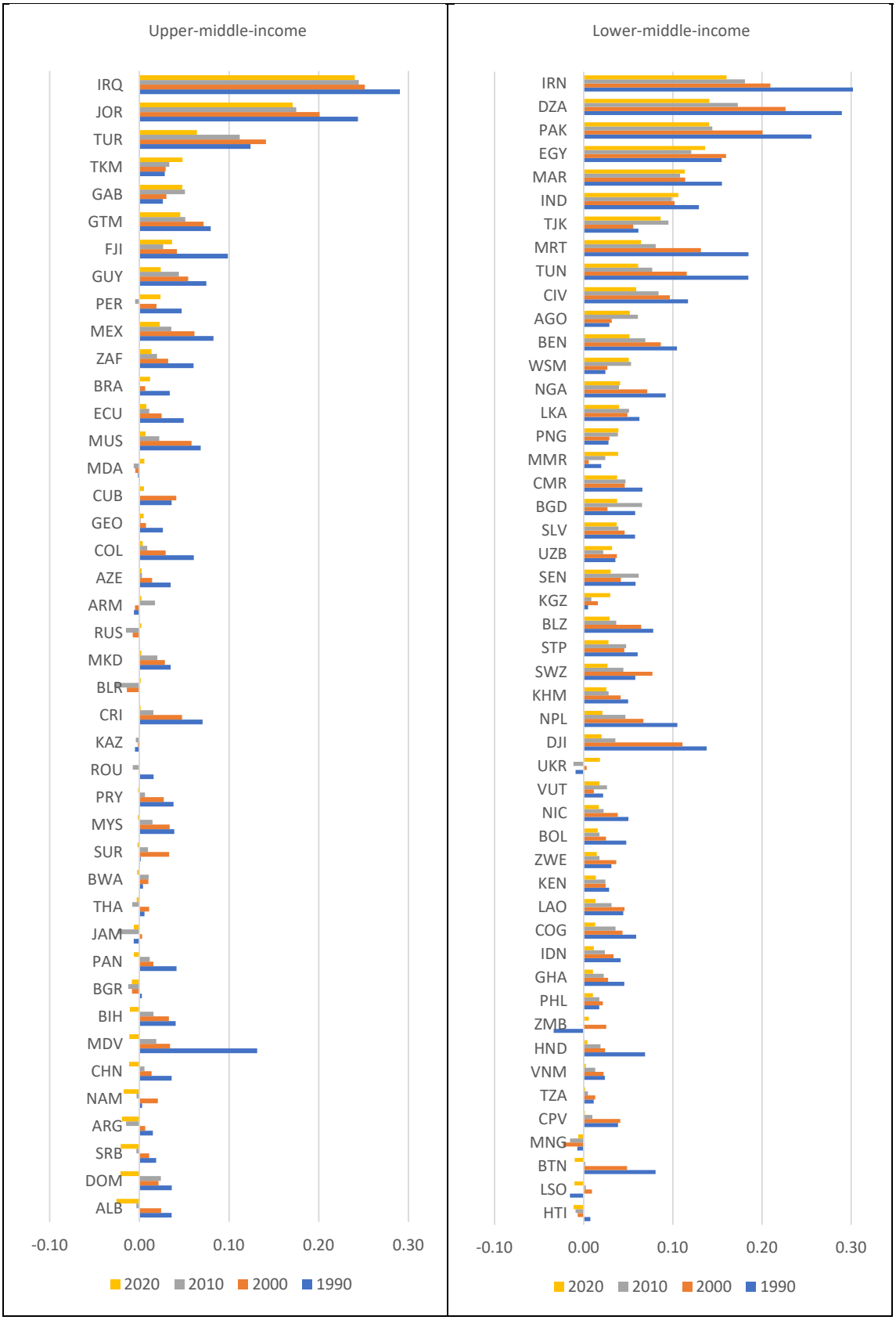
Source: Authors' own calculations.

Figure 18. Gini gender coefficients in High- and Low-income countries



Source: Authors' own calculations.

Figure 19. Gini gender coefficients in Upper- and Lower-middle-income countries



Source: Authors' own calculations.

In Figure 17, the annual time series of the estimated Gini gender coefficients over the period 1990-2020 is presented for the four income groups. The presumable impact of the 'global financial crisis of 2007-2008' is quite visible in Figure 17, and especially, for Low-income and Lower-middle-income groups. It seems that the Gini coefficients for Low-income group had kept roughly stable since 1990 until the 'global financial crisis of 2007-2008' occurred and pushed up accordingly the estimated value for a couple of years, and then went down gradually until the end of the observed period.

Despite some similarity between the time series of Lower-middle-income and Low-income groups, in particular, as regards the presumable impact of the 'global financial crisis of 2007-2008', the general pattern of the Gini coefficient for Lower-middle-income group, and indeed, for Upper-middle-income group as well, was a gradual downward trend over time. This observation may be interpreted as that for Middle- and Low-income groups, the distribution of human capital between educated males and females had become evener over the observed entire period 1990-2020.

As for High-income group, the estimated Gini gender coefficient declined gradually from a positive value in 1990, first became negative in 1998, and then dropping further in value until the end in 2020. However, though negative, the absolute value of the Gini coefficient increased after 1998, implying that after 1998, more and more human capital was developed/owned by educated females than their male counterpart in High-income group, in other words, the gender distribution of human capital became more uneven after 1998, but to the favor of educated females rather than educated males in High-income group. Therefore, broadly speaking, the higher income an income group had, the lower the value of the estimated Gini gender coefficients would be. However, the results should be interpreted with due caution.

The estimated Gini gender coefficients for countries are presented in Figure 18 for High- and Low-income group countries (i.e., 51 and 23 countries/economies, respectively), and in Figure 19 for Upper- and Lower-middle-income group countries (i.e., 42 and 49 countries/economies, respectively), in the selected four years, i.e., 1990, 2000, 2010, and 2020. In Figures 18 and 19, all counties are listed, from top to bottom, in descending order according to the value of the estimated Gini coefficient for each country in 2020.

Some general observations can be drawn which are consistent with the pattern as shown in Figure 17. In general, the Gini gender coefficients in most countries declined over the four selected years except that in Low-income group, many countries had either stable or even increasing Gini coefficients. The lower income a group had, the more possible the countries there would have higher value of the estimated Gini gender coefficients.

In addition, the higher income a group had, the more there were countries which had negative values of the Gini gender coefficients, meaning that educated females developed/owned more human capital than males in these countries. For instance, all the countries in the Nordic region, i.e., Sweden (SWE), Iceland (ISL), Denmark (DNK), Norway (NOR), and Finland (FIN), had negative values of the estimated Gini gender coefficients, and over the selected four years, educated males developed/owned less and less human capital than their female counterparts in the Nordic countries.

5. Decomposition analysis

Decomposition analysis is applied in the chapter, with the purpose to identify the sources of the human capital growth, within the methodology framework employed by the new IWR for human capital estimation (see Liu, 2021).

5.1 Decomposition method

In the new IWR report, human capital in a country (or economy), *HC*, is estimated by using the following formula:

(1) $$HC = \underbrace{e^{\rho \cdot Edu}}_{Term_1} \cdot \underbrace{P_{5+Edu}}_{Term_2} \cdot \underbrace{\int_0^T w \cdot e^{-\delta\tau} d\tau}_{Term_3},$$

where ρ is the return of years of schooling, *Edu* is the expected years of schooling, P_{5+edu} is the educated individuals who aged 5 or older, T is the employee's expected remained working years, *w* is the average annual labor compensation, and δ is the discount rate.

In addition, the factor $Term_i$ (*i* = 1, 2, 3) in (1) is defined as follows: $Term_1$represents 'Education effect', which is determined by the expected years of schooling; $Term_2$ represents 'Educated population effect', which is determined by the number of educated individuals; and $Term_3$ represents 'Compensation to human capital effect', which is primarily determined by the labor compensation and the expected remained working years.

Since human capital of a country (or economy) *k* in a region consisting of *K* countries (or economies) is estimated separately for males and females (gender being indexed by *j*, *j* = 1, 2), one has:

(2) $$HC_{jk} = \prod_i Term_{ijk}, \quad i = 1, 2, 3; j = 1, 2; k = 1, 2, \ldots K,$$

and the total regional human capital, HC^R will be:

(3) $$HC^R = \sum_{jk} HC_{jk} = \sum_{jk}\left(\prod_i Term_{ijk}\right), \quad i = 1, 2, 3; j = 1, 2; k = 1, 2, \ldots K.$$

By using the logarithmic mean function as weights, the (percentage) growth of regional human capital defined in equation (3) can be decomposed as:

(4) $$\frac{\Delta HC^R}{HC^R} = \frac{\sum_{jk}\Delta HC_{jk}}{HC^R} = \left(\sum_i \sum_{jk} \frac{\Delta HC_{jk}}{\Delta(lnHC_{jk})} \Delta lnTerm_{ijk}\right)/HC^R, \; i = 1, 2, 3; j = 1, 2; k = 1, 2, \ldots K,$$

where Δ stands for the change of variable between two time points.

Formally, the contribution by each factor indexed by Term *i*, gender *j*, and country *k* to the regional human capital growth is defined as:

(5) $$\textit{Contribution (i, j, k)} = \left(\frac{\Delta HC_{jk}}{\Delta(lnHC_{jk})} \Delta lnTerm_{ijk}\right)/HC^R, \; i = 1, 2, 3; j = 1, 2; k = 1, 2, \ldots K.$$

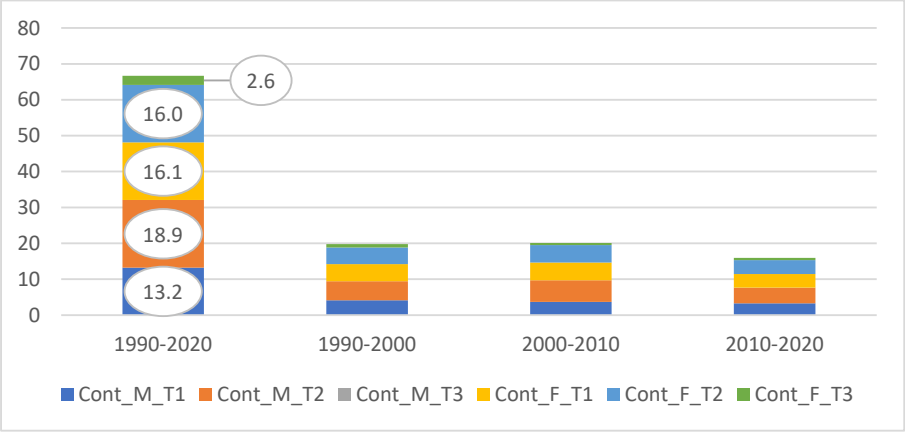
5.2 Decomposition results

Clearly, equation (5) can also be employed for calculating the contribution by Term *i* and gender *j* to a country's human capital growth, by simply setting K = 1 (i.e., treating a region as having only one country or economy). The calculated results for 166 countries/economies over the entire period 1990-2020 are reported in Table C1 in Appendix C, which can be used for detailed analyses for each country. Similar results can be derived for the subperiods such as 1990-2000, 2000-2010, and 2010-

2020, and in fact, the contribution by Terms and gender to county *annual* human capital growth can also be derived by using the same decomposition method as outlined in subsection 5.1 above.

Considering the World as one region, the contributions to the World human capital growth by Term and gender over the entire period 1990-2020, as well as over the three subperiods, are shown in Figure 20. Over the entire period 1990-2020, females (denoted by 'F') contributed about 52 percent, while males (denoted by 'M') contributed around 48 percent to the World human capital growth. The conclusion that the contribution from females was larger than that from males was also valid for the three subperiods.

Figure 20. Contribution to the World human capital growth, by Term and gender (%)



Source: Authors' own calculations.

By Terms only, over the entire period 1990-2020, the contribution of Term2 (Educated population effect, denoted by 'T2') was the largest, followed by that of Term1 (Education effect, denoted by 'T1'), with the two Terms accounting for about 97 percent of the World human capital growth, leaving Term3 (Compensation to human capital effect, denoted by 'T3') contributing only a tiny piece of the World growth. This general pattern was valid for all three subperiods as well.

By both gender and Terms, the contributions are ranked in descending order as: Male Term2 (Cont_M_T2), Female Term1 (Cont_F_T1), Female Term2 (Cont_F_T2), Male Term1 (Cont_M_T1), Female Term3 (Cont_F_T3), and Male Term3 (Cont_M_T3). The ranking was the same for both the entire period 1990-2020, and the two subperiods 1990-2000 and 2000-2010. For the last subperiod 2010-2020, only the ranks of Female Term1 (Cont_F_T1) and Female Term2 (Cont_F_T2) interchanged, with the ranks of all the other factors unaffected. Note that the contribution by Male Term 3 (Cont_M_T3) was - 0.2 percent for both 1990-2020 and 1990-2000 and was zero for both subperiods 2000-2010 and 2010-2020. All these figures are too small to be discernible in Figure 20.

Subsection 3.1 has shown that the growth of the World human capital declined from the second subperiod 2000-2010 to the last subperiod 2010-2020. It seems that the contribution from either males or females dropped to about the same extent over the last two subperiods. Moreover, the ranking of the contribution reduction cross-classified by both gender and Terms over the last two subperiods was in the same order as their corresponding contribution to the World human capital growth over the entire period, implying that the reduction during the last subperiod was a universal shock affecting almost all the factors proportionately behind the downward change of the human capital growth during the last subperiod 2010-2020.

The decomposition of the World human capital growth into the regional (or income group) contribution by gender and various factors (Terms) over the entire period as well as the three subperiods can also be undertaken within the same decomposition framework as outlined in subsection 5.1. However, in the following, focus will be placed on the country contribution by gender and Terms to the regional human capital growth over the entire period 1990-2020, as well as the three subperiods: 1990-2000, 2000-2010, and 2010-2020, though similar analysis can also be carried out for decomposing *annual* regional human capital growth into different contribution components.

For each region, the detailed country contributions by gender and Terms to the regional human capital growth over the entire period 1990-2020 is reported in one Table, in which a few summary statistics are also presented, such as the maximum, minimum, mean, and median values of each contribution of the factors behind the regional human capital growth in the region. Without the summary statistics, the similar information across the three subperiods (1990-2000, 2000-2010, and 2010-2020) are displayed in one Figure for each region as well.

Advanced Economies

As shown in Table 2, the human capital growth in this region over the entire period 1990-2020 was 51.2 %, which came mostly from Term2 (27.6 percentage points), followed by Term1 (21.1 percentage points) and Term3 (2.4 percentage points). The regional growth of 51.2 % could also be attributed to the contributions from, in descending order, Male Term2 (14.2 percentage points), Female Term2 (13.4 percentage points), Female Term1 (11.8 percentage points), Male Term1 (9.3 percentage points), Female Term3 (2.6 percentage points), and Male Term3 (-0.2 percentage points). By gender only, the regional growth could also be explained by the contributions from males (23.3 percentage points) and females (27.8 percentage points).

In summary, it was the 'Educated population effect', and in particular, the effect from educated males that contributed most to the regional human capital growth over the entire period 1990-2020. 'Education effect', and especially, increased expected years of schooling by females, contributed also substantially. On the contrary, the 'Compensation to human capital effect' was small, and moreover, this effect from males in fact dragged down the regional growth, though with a small margin.

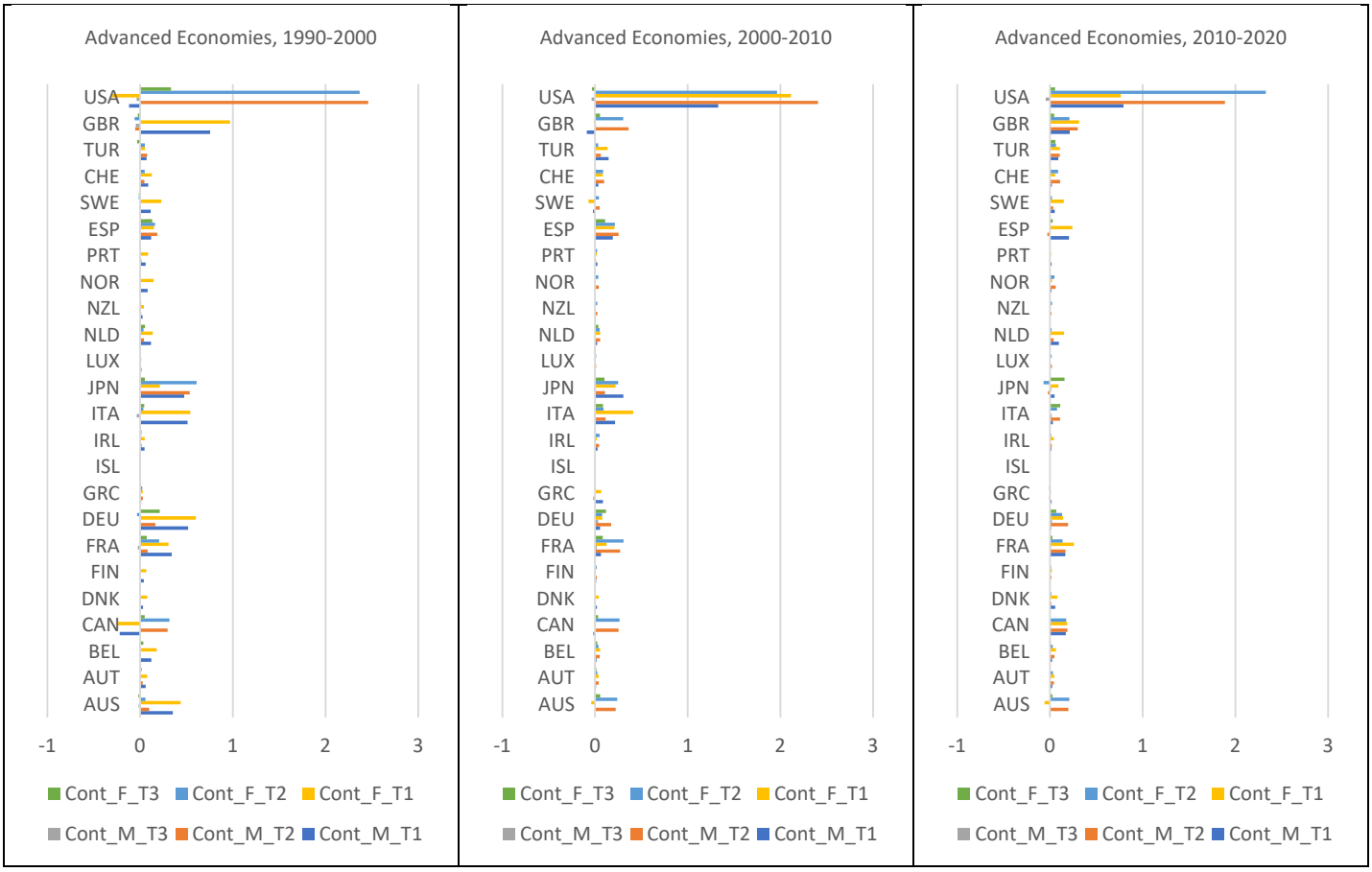
Table 2. Country contribution by gender and Terms to regional human capital growth, Advanced Economies, 1990-2020 (%)

Country	Code	Male			Female			SUM			
		Term1	Term2	Term3	Term1	Term2	Term3	Term1	Term2	Term3	Total
Advanced Economies		***9.3***	***14.2***	***-0.2***	***11.8***	***13.4***	***2.6***	***21.1***	***27.6***	***2.4***	***51.2***
Australia	AUS	0.4	0.6	0.0	0.4	0.5	0.1	0.8	1.1	0.1	2.0
Austria	AUT	0.1	0.1	0.0	0.2	0.1	0.0	0.3	0.2	0.0	0.5
Belgium	BEL	0.2	0.1	0.0	0.3	0.1	0.1	0.5	0.2	0.1	0.8
Canada	CAN	-0.1	0.9	0.0	-0.1	0.9	0.1	-0.2	1.8	0.1	1.8
Denmark	DNK	0.1	0.0	0.0	0.2	0.0	0.0	0.4	0.1	0.0	0.4
Finland	FIN	0.1	0.1	0.0	0.1	0.0	0.0	0.2	0.1	0.0	0.2
France	FRA	0.7	0.6	0.0	0.8	0.7	0.2	1.4	1.4	0.2	3.0
Germany	DEU	0.6	0.6	0.1	0.9	0.2	0.4	1.5	0.8	0.5	2.8
Greece	GRC	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.3
Iceland	ISL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ireland	IRL	0.1	0.1	0.0	0.1	0.1	0.0	0.2	0.2	0.0	0.4
Italy	ITA	0.8	0.3	0.0	1.1	0.2	0.3	1.9	0.5	0.2	2.6
Japan	JPN	0.9	0.6	0.0	0.6	0.8	0.4	1.5	1.5	0.4	3.3
Luxembourg	LUX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1

Netherlands	NLD	0.3	0.2	0.0	0.4	0.1	0.1	0.7	0.3	0.1	1.1
New Zealand	NZL	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.2
Norway	NOR	0.1	0.1	0.0	0.2	0.1	0.0	0.3	0.2	0.0	0.5
Portugal	PRT	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.1	0.0	0.3
Spain	ESP	0.6	0.5	0.0	0.7	0.4	0.3	1.2	0.9	0.3	2.5
Sweden	SWE	0.2	0.1	0.0	0.4	0.1	0.0	0.5	0.1	0.0	0.7
Switzerland	CHE	0.2	0.3	0.0	0.3	0.3	0.0	0.5	0.6	0.0	1.1
Turkey	TUR	0.4	0.3	0.0	0.4	0.2	0.0	0.7	0.5	0.0	1.2
United Kingdom of Great Britain and Northern Ireland	GBR	1.0	0.7	0.0	1.5	0.5	0.1	2.5	1.2	0.1	3.7
United States of America	USA	2.4	7.9	-0.1	3.0	7.9	0.4	5.4	15.8	0.3	21.5
Maximum		***2.4***	***7.9***	***0.1***	***3.0***	***7.9***	***0.4***	***5.4***	***15.8***	***0.5***	***21.5***
Minimum		***-0.1***	***0.0***	***-0.1***	***-0.1***	***0.0***	***0.0***	***-0.2***	***0.0***	***0.0***	***0.0***
Mean		***0.4***	***0.6***	***0.0***	***0.5***	***0.6***	***0.1***	***0.9***	***1.2***	***0.1***	***2.1***
Median		***0.2***	***0.1***	***0.0***	***0.3***	***0.1***	***0.0***	***0.5***	***0.2***	***0.0***	***0.9***

Source: Authors' own calculations.

Figure 21. Country contribution by gender and Terms to regional human capital growth, Advanced Economies, 1990-2000, 2000-2010, and 2010-2020 (%)



Source: Authors' own calculations.

Figure 8 in subsection 3.2 has shown that United States of America (USA) dominated in the region in terms of the contribution to the regional human capital growth, over both the entire period, and the three subperiods. As shown in Table 2, over the entire period 1990-2020, it was Term2 (Educated population effect), equally distributed between males and females (7.9 percentage points by each),

that contributed most to the regional growth, followed by female and male Term1 (Education effect) (3.0 and 2.4 percentage points, respectively), and then by female and male Term3 (Compensation to human capital effect) (0.4 and -0.1 percentage points, respectively). In total, males contributed less than females (10.1 vs. 11.3 percentage points) in the USA over the entire periods 1990-2020.

Over the three subperiods, detailed country contribution by gender and Terms to the regional growth could vary. For example, as shown in Figure 21, for the USA, during the first subperiod 1990-2000, the contribution of Term1 (Education effect) from either males or females was negative, while during the second subperiod 2000-2010, the contribution from the two factors (esp. that from females) became positive and substantially large. In contrast, the contribution of Term3 (Compensation to human capital effect) dropped during the same period for the USA, almost solely from females. Compared with the second subperiod, during the last subperiod, the contribution from almost all the factors decreased except for two: Female Term2 and Term3 which increased slightly. However, the total contribution from the USA declined during the last subperiod.

Figure 8 in subsection 3.2 also shows that Japan (JPN) started with the 2nd place but ended up at the 13th place among 24 countries/economies in the region, quite to the opposite, Canada (CAN) changed its place from the 15th to the 4th over the same period. As shown in Figure 21, the main reason behind the Japanese story was the consistent contribution decrease from Term2 (Educated population effect), and esp., Term2 from females, while that behind the Canadian story was the rapid contribution increase from Term1 (Education effect), and slightly more from females over the three subperiods.

Certainly, the change of the country contribution rank for one country depended also upon the change of actual contributions from other countries in the region over the same subperiods. But the observations drawn from Figure 21 and described above provide the crucially detailed quantitative information for better understanding not only the change of country contribution rank, but also the detailed sources by gender and factors of the regional human capital growth over the subperiods.

East Asia & Pacific

Over the entire period 1990-2020, the growth of human capital in this region was 110.7 %, which came mostly from Term1 (62.5 percentage points), followed by Term2 (48.4 percentage points). Term3 actually dragged down the regional growth by 0.2 percentage points.

In this region and over the entire period 1990-2020, males contributed less than females (51.6 vs. 59.1 percentage points). The contributions from the six factors were, in descending order, Female Term1 (35.6 percentage points), Male Term1 (26.9 percentage points), Male Term2 (25.4 percentage points), Female Term2 (23.0 percentage points), Female Term3 (0.4 percentage points), and Male Term3 (-0.6 percentage points).

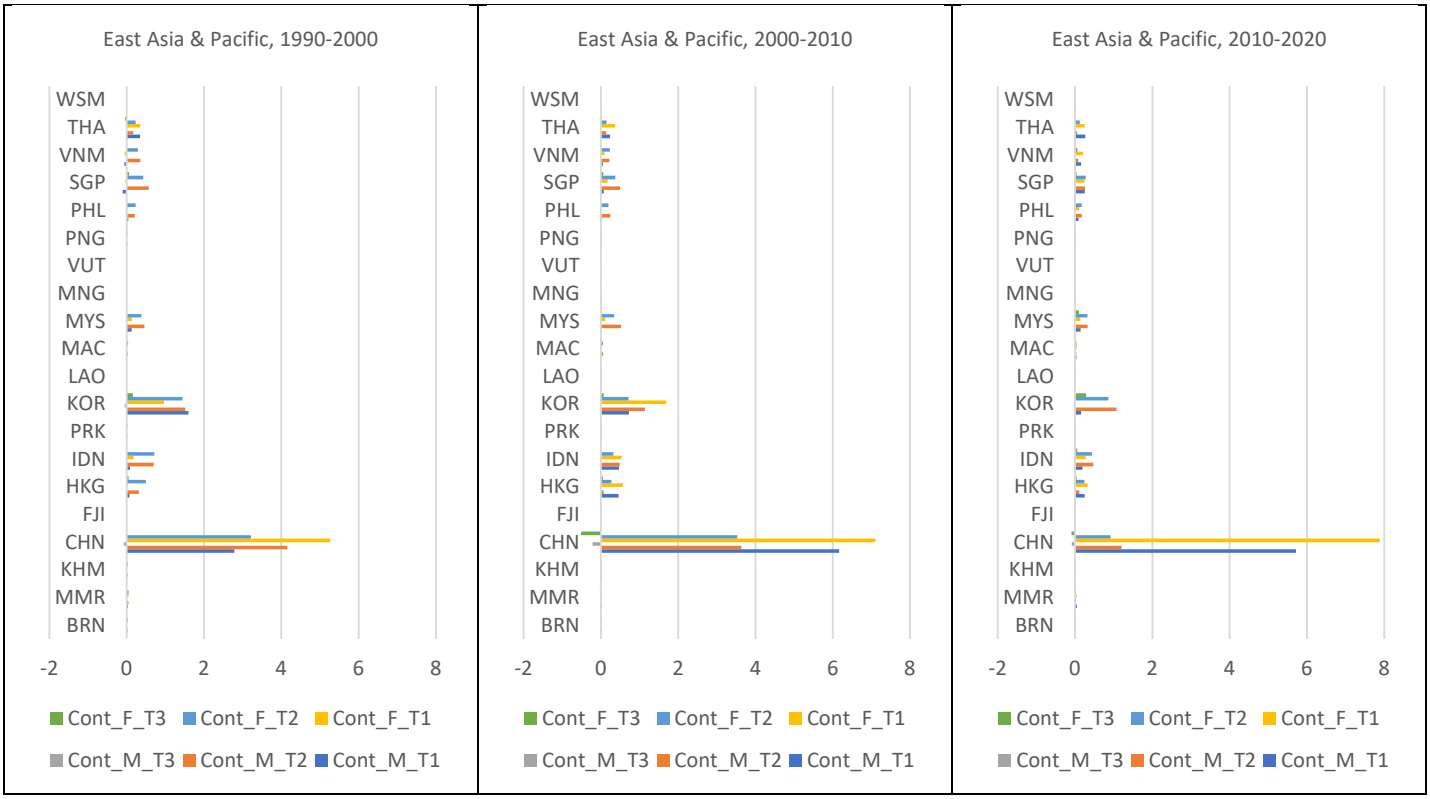
Table 3. Country contribution by gender and Terms to regional human capital growth, East Asia & Pacific, 1990-2020 (%)

Country	Code	Male			Female			SUM			
		Term1	Term2	Term3	Term1	Term2	Term3	Term1	Term2	Term3	Total
East Asia & Pacific		***26.9***	***25.4***	***-0.6***	***35.6***	***23.0***	***0.4***	***62.5***	***48.4***	***-0.2***	***110.7***
Brunei Darussalam	BRN	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.2
Myanmar	MMR	0.1	0.1	0.0	0.1	0.1	0.0	0.3	0.2	0.0	0.5
Cambodia	KHM	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.2
China	CHN	19.5	11.7	-0.5	26.8	10.2	-0.8	46.3	21.9	-1.3	66.9
Fiji	FJI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Hong Kong	HKG	1.0	0.6	0.0	1.2	1.4	0.2	2.2	2.0	0.2	4.4
Indonesia	IDN	1.0	2.2	0.0	1.3	1.9	0.1	2.3	4.1	0.1	6.5
Korea (Democratic People's Republic of)	PRK	0.0	0.1	0.0	0.0	0.1	0.0	-0.1	0.1	0.0	0.0
Korea, Republic of	KOR	3.0	4.6	-0.1	3.2	3.8	0.7	6.2	8.4	0.6	15.2
Lao People's Democratic Republic	LAO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Macao	MAC	0.0	0.2	0.0	0.1	0.2	0.0	0.1	0.3	0.0	0.5
Malaysia	MYS	0.4	1.7	0.0	0.5	1.4	0.1	0.9	3.1	0.1	4.1
Mongolia	MNG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Vanuatu	VUT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Papua New Guinea	PNG	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.2
Philippines	PHL	0.2	0.8	0.0	0.2	0.8	0.0	0.4	1.6	0.0	2.0
Singapore	SGP	0.3	1.8	0.0	0.5	1.5	0.2	0.8	3.3	0.2	4.3
Viet Nam	VNM	0.2	0.8	0.0	0.3	0.8	0.0	0.5	1.6	0.0	2.1
Thailand	THA	1.1	0.5	0.0	1.2	0.6	-0.1	2.3	1.1	-0.1	3.3
Samoa	WSM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum		***19.5***	***11.7***	***0.0***	***26.8***	***10.2***	***0.7***	***46.3***	***21.9***	***0.6***	***66.9***
Minimum		***0.0***	***0.0***	***-0.5***	***0.0***	***0.0***	***-0.8***	***-0.1***	***0.0***	***-1.3***	***0.0***
Mean		***1.3***	***1.3***	***0.0***	***1.8***	***1.2***	***0.0***	***3.1***	***2.4***	***0.0***	***5.5***
Median		***0.1***	***0.1***	***0.0***	***0.1***	***0.1***	***0.0***	***0.2***	***0.3***	***0.0***	***0.5***

Source: Authors' own calculations.

Figure 22. Country contribution by gender and Terms to regional human capital growth, East Asia & Pacific, 1990-2000, 2000-2010, and 2010-2020 (%)



Source: Authors' own calculations.

In this region, China (CHN) was dominant. Over the entire period, the contribution in China from Term1 (46.3 percentage points) was more than double that from Term2 (21.9 percentage points), while that from Term3 was negative (-1.3 percentage points). Female Term1 contributed more than

its male counterpart (26.8 vs. 19.5 percentage points), while it was reverse for Term2 (10.2 vs. 11.7 percentage points). Female Term3 cut more the regional growth than its male counterpart (-0.8 vs. -0.5 percentage points). In sum, males contributed less than females (30.7 vs. 36.2 percentage points) in China over the period 1990-2020.

As shown in Figure 22, over the three subperiods, although the contribution from Term2 decreased substantially, that from Term1 increased a lot, more from males, from already higher level at the beginning, which to large extent had assured China (CHN) staying at the first place in terms of the contribution in the region.

Figure 9 in subsection 3.2 shows that Thailand (THA) fell from the 5th to the 7th place, while Singapore (SGP) climbed up from the 7th to the 4th place among 20 countries/economies in the region across the three subperiods. Figure 22 demonstrates that it was the consistent contribution reduction from Term2, and slightly less from Term1 that was behind the downfall of Thailand (THA), while it was the continuous contribution augmentation of Term1, largely from males, that was behind the rise of Singapore (SGP).

Europe & Central Asia

Over the period 1990-2020, the regional growth of human capital was 36.3 %, which originated predominantly from Term1 (31.3 percentage points), followed by Term2 (4.9 percentage points), and then by Term3 (0.2 percentage points). The contributions from detailed factors were, in descending order, Female Term1 (17.8 percentage points), Male Term1 (13.5 percentage points), Female Term2 (2.7 percentage points), Male Term2 (2.2 percentage points), Female Term3 (0.3 percentage points), and Male Term3 (-0.2 percentage points). In sum, males contributed less than females (15.6 vs. 20.8 percentage points).

In this region, Russian Federation (RUS) contributed most. Over the entire period, the Russian contribution from Term1 was the largest (12.2 percentage points), followed by Term2 (1.3 percentage points). Term3 of Russian Federation (RUS) took away a small margin from the regional growth (0.2 percentage points). The contribution from each female Term was larger than its male counterpart in Russian Federation (RUS) over the period 1990-2020 (see Table 4).

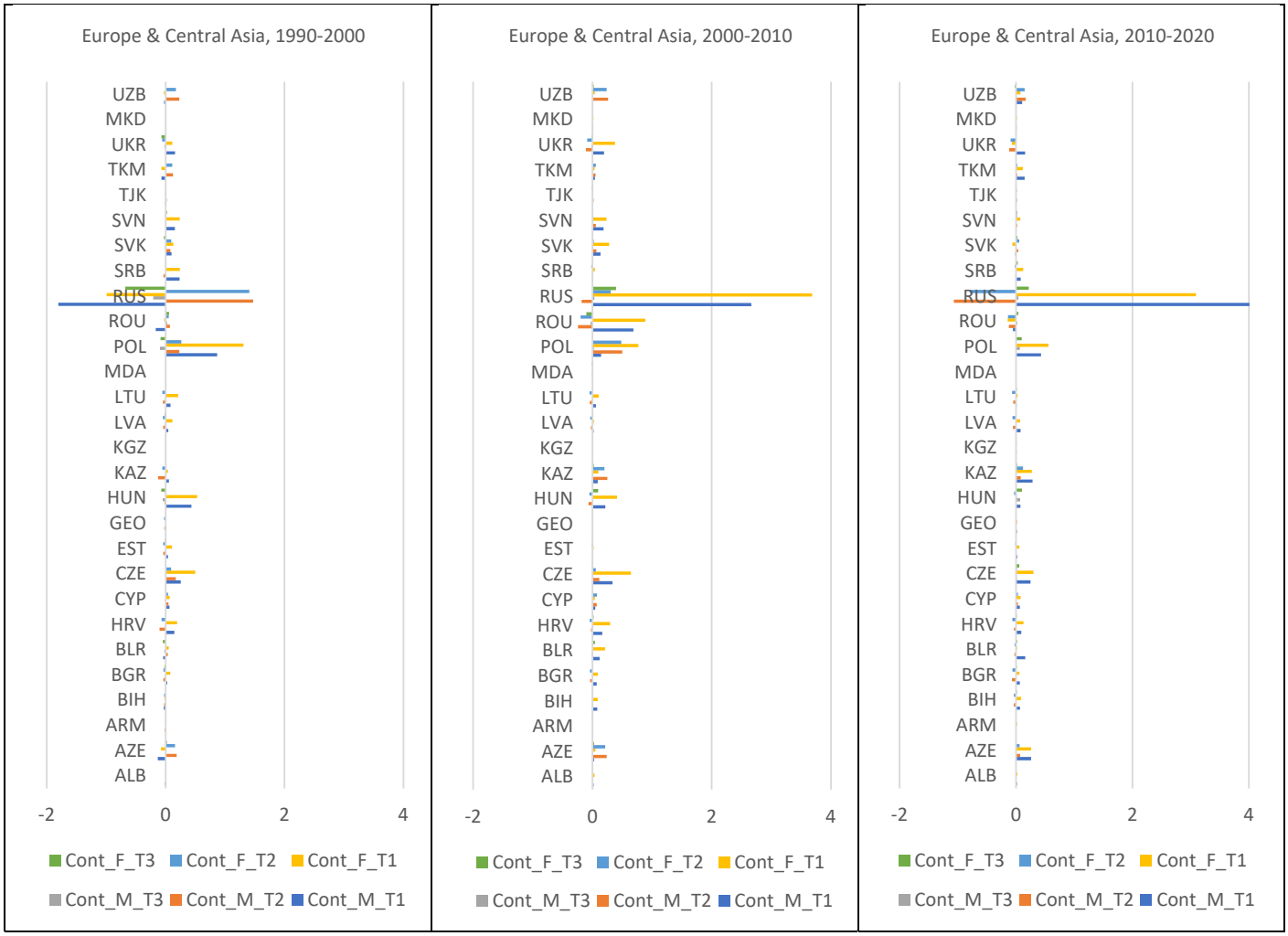
Table 4. Country contribution by gender and Terms to regional human capital growth, Europe & Central Asia, 1990-2020 (%)

Country	Code	Male			Female			SUM			
		Term1	Term2	Term3	Term1	Term2	Term3	Term1	Term2	Term3	Total
Europe & Central Asia		***13.5***	***2.2***	***-0.2***	***17.8***	***2.7***	***0.3***	***31.3***	***4.9***	***0.2***	***36.3***
Albania	ALB	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1
Azerbaijan	AZE	0.1	0.6	0.0	0.2	0.5	0.1	0.4	1.1	0.1	1.5
Armenia	ARM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bosnia and Herzegovina	BIH	0.1	-0.1	0.0	0.2	-0.1	0.0	0.3	-0.2	0.0	0.2
Bulgaria	BGR	0.2	-0.2	0.0	0.2	-0.2	0.0	0.4	-0.3	0.0	0.1
Belarus	BLR	0.3	0.0	0.0	0.3	0.0	0.0	0.6	0.0	0.0	0.6
Croatia	HRV	0.4	-0.2	0.0	0.7	-0.2	0.0	1.1	-0.4	0.0	0.8
Cyprus	CYP	0.2	0.2	0.0	0.2	0.2	0.0	0.4	0.3	0.0	0.7
Czechia	CZE	0.9	0.3	0.0	1.5	0.2	0.1	2.5	0.5	0.1	3.0
Estonia	EST	0.1	0.0	0.0	0.2	-0.1	0.0	0.3	-0.1	0.0	0.2
Georgia	GEO	0.0	0.0	0.0	0.0	0.0	0.0	0.1	-0.1	0.0	0.0
Hungary	HUN	0.8	-0.1	0.0	1.0	-0.1	0.1	1.8	-0.2	0.2	1.7
Kazakhstan	KAZ	0.5	0.2	0.0	0.5	0.3	0.0	1.0	0.5	0.0	1.6

Kyrgyzstan	KGZ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Latvia	LVA	0.2	-0.1	0.0	0.2	-0.2	0.0	0.4	-0.3	0.0	0.1
Lithuania	LTU	0.2	-0.1	0.0	0.3	-0.2	0.0	0.5	-0.3	0.0	0.2
Moldova, Republic of	MDA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Poland	POL	1.6	0.7	0.0	2.8	0.8	0.0	4.4	1.5	0.0	5.9
Romania	ROU	0.5	-0.3	0.0	0.7	-0.3	0.0	1.2	-0.6	0.0	0.6
Russian Federation	RUS	5.7	0.2	-0.2	6.5	1.1	-0.1	12.2	1.3	-0.2	13.3
Serbia	SRB	0.3	-0.1	0.0	0.4	0.0	0.0	0.8	-0.1	0.1	0.7
Slovakia	SVK	0.2	0.2	0.0	0.4	0.2	0.0	0.6	0.4	0.0	1.0
Slovenia	SVN	0.4	0.1	0.0	0.6	0.0	0.1	1.0	0.1	0.1	1.1
Tajikistan	TJK	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Turkmenistan	TKM	0.1	0.3	0.0	0.1	0.2	0.0	0.2	0.5	0.0	0.6
Ukraine	UKR	0.5	-0.2	0.0	0.4	-0.3	-0.1	1.0	-0.5	-0.1	0.3
North Macedonia	MKD	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1
Uzbekistan	UZB	0.1	0.7	0.0	0.1	0.6	0.0	0.1	1.4	0.0	1.5
Maximum		***5.7***	***0.7***	***0.0***	***6.5***	***1.1***	***0.1***	***12.2***	***1.5***	***0.2***	***13.3***
Minimum		***0.0***	***-0.3***	***-0.2***	***0.0***	***-0.3***	***-0.1***	***0.0***	***-0.6***	***-0.2***	***0.0***
Mean		***0.5***	***0.1***	***0.0***	***0.6***	***0.1***	***0.0***	***1.1***	***0.2***	***0.0***	***1.3***
Median		***0.2***	***0.0***	***0.0***	***0.2***	***0.0***	***0.0***	***0.4***	***0.0***	***0.0***	***0.6***

Source: Authors' own calculations.

Figure 23. Country contribution by gender and Terms to regional human capital growth, Europe & Central Asia, 1990-2000, 2000-2010, and 2010-2020 (%)



Source: Authors' own calculations.

Figure 10 in subsection 3.2 indicates that both Russian Federation (RUS) and Kazakhstan (KAZ) enhanced their status dramatically from the bottom at the start to the 1st and the 3rd place respectively in the end. As shown in Figure 23, during the first subperiod 1990-2000, the positive contribution from Term2 in Russian Federation (RUS) was not enough for compensating the negative loss from Term1 and Term3, leading to Russian Federation (RUS) undermining the regional growth and staying at the bottom of the region. However, already during the second subperiod 2000-2010, despite a contribution reduction from Term2, both Term1 and Term3, esp., from females, contributed positively and drastically, pushing Russian Federation (RUS) up to the contribution top. During the last subperiod 2010-2020, though the contribution from Term2 became negative, that from Term1, this time largely from males, increased further, and that from Term3 declined with a small margin, primarily from females. In the end, Russian Federation (RUS) maintained its first place among 28 countries/economies in this region.

During the first subperiod, Kazakhstan (KAZ) stayed at the second lowest place (27th) in the region, mainly due to the negative contribution from Term2. However, the contribution from Term2 became positive and increased substantially, largely from males, during the second subperiod, meanwhile, that from Term1 also increased, mainly from females. During the last subperiod, despite a contribution reduction from Term2, mainly due to males, the contribution from Term1 augmented considerably and almost equally from both males and females. Over the three subperiods, the contribution from Term3 were close to zero. In the end, Kazakhstan (KAZ) stood up at the 3rd place in the region. Figure 10 in subsection 3.2 also shows that Romania (ROU) started from the 19th place, climbed up to the 4th place and ended up at the bottom of the region. As revealed by Figure 23, the main reason behind the Romanian 'Up and down' story was due to a dramatical contribution uplift from Term1, equally from males and females, during the second subperiod, and an equivalent contribution reduction from Term1, slightly more from females, during the last subperiod.

Latin America & Caribbean

Over the entire subperiod 1990-2020, the regional human capital growth was 154.2 %, which stemmed mainly from Term1 (76.1 percentage points), followed by Term2 (69.7 percentage points), and then by Term3 (8.5 percentage points).

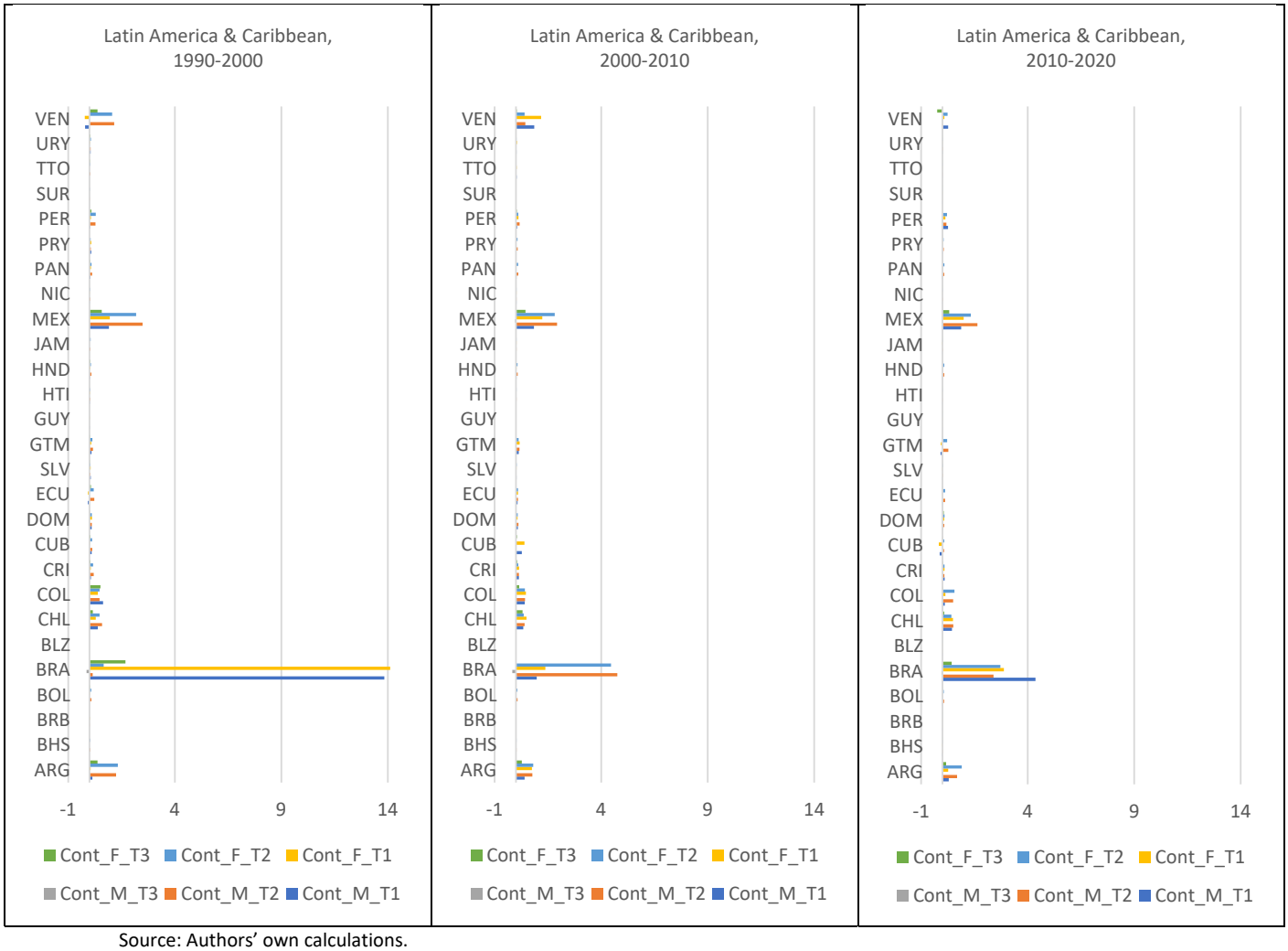
Table 5. Country contribution by gender and Terms to regional human capital growth, Latin America & Caribbean, 1990-2020 (%)

Country	Code	Male			Female			SUM			
		Term1	Term2	Term3	Term1	Term2	Term3	Term1	Term2	Term3	Total
Latin America & Caribbean		***38.2***	***35.3***	***-0.7***	***37.9***	***34.3***	***9.2***	***76.1***	***69.7***	***8.5***	***154.2***
Argentina	ARG	1.3	3.8	0.0	1.6	4.4	1.2	2.9	8.2	1.2	12.3
Bahamas	BHS	0.0	0.1	0.0	0.0	0.1	0.0	-0.1	0.3	0.0	0.2
Barbados	BRB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Bolivia (Plurinational State of)	BOL	0.0	0.3	0.0	0.0	0.3	0.0	0.0	0.6	0.0	0.7
Brazil	BRA	26.1	10.2	-0.5	24.4	10.2	2.8	50.4	20.4	2.3	73.2
Belize	BLZ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Chile	CHL	1.8	2.2	0.0	1.9	1.9	0.8	3.7	4.1	0.8	8.7
Colombia	COL	1.6	2.0	0.0	1.4	2.0	1.0	3.0	4.0	1.0	8.0
Costa Rica	CRI	0.4	0.6	0.0	0.4	0.6	0.2	0.9	1.2	0.2	2.3
Cuba	CUB	0.3	0.3	0.0	0.3	0.3	0.2	0.6	0.5	0.1	1.2
Dominican Republic	DOM	0.3	0.4	0.0	0.4	0.4	0.1	0.7	0.9	0.1	1.7
Ecuador	ECU	0.0	0.6	0.0	0.0	0.6	0.1	0.0	1.2	0.1	1.4

El Salvador	SLV	0.1	0.1	0.0	0.1	0.2	0.0	0.2	0.3	0.0	0.5
Guatemala	GTM	0.2	0.9	0.0	0.3	0.7	0.0	0.5	1.6	0.0	2.1
Guyana	GUY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Haiti	HTI	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.3
Honduras	HND	0.0	0.4	0.0	0.1	0.3	0.1	0.1	0.7	0.1	0.9
Jamaica	JAM	0.0	0.1	0.0	0.0	0.1	0.0	-0.1	0.3	0.0	0.2
Mexico	MEX	3.9	8.8	-0.2	4.6	7.8	1.9	8.5	16.6	1.8	26.9
Nicaragua	NIC	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.2	0.0	0.3
Panama	PAN	0.1	0.4	0.0	0.1	0.4	0.1	0.1	0.9	0.1	1.1
Paraguay	PRY	0.1	0.3	0.0	0.1	0.2	0.0	0.3	0.5	0.0	0.8
Peru	PER	0.6	1.0	0.0	0.5	0.9	0.2	1.0	1.9	0.2	3.1
Suriname	SUR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Trinidad and Tobago	TTO	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.0	0.3
Uruguay	URY	0.1	0.1	0.0	0.1	0.2	0.1	0.2	0.3	0.1	0.6
Venezuela (Bolivarian Republic of)	VEN	1.3	2.1	0.0	1.4	2.3	0.2	2.7	4.3	0.2	7.2
Maximum		***26.1***	***10.2***	***0.0***	***24.4***	***10.2***	***2.8***	***50.4***	***20.4***	***2.3***	***73.2***
Minimum		***0.0***	***0.0***	***-0.5***	***0.0***	***0.0***	***0.0***	***-0.1***	***0.0***	***0.0***	***0.0***
Mean		***1.4***	***1.3***	***0.0***	***1.4***	***1.3***	***0.3***	***2.8***	***2.6***	***0.3***	***5.7***
Median		***0.1***	***0.3***	***0.0***	***0.1***	***0.3***	***0.1***	***0.2***	***0.6***	***0.1***	***0.9***

Source: Authors' own calculations.

Figure 24. Country contribution by gender and Terms to regional human capital growth, Latin America & Caribbean, 1990-2000, 2000-2010, and 2010-2020 (%)



Source: Authors' own calculations.

The contributions from different factors were, in descending order, Male Term1 (38.2 percentage points), Female Term1 (37.9 percentage points), Male Term2 (35.3 percentage points), Female Term2 (34.3 percentage points), Female Term3 (9.2 percentage points), and Male Term3 (-0.7 percentage points). In sum, males contributed less than females in this region (72.8 vs. 81.4 percentage points), but the difference was primarily due to that the contribution from Term3 (Compensation to human capital effect) was significantly larger for females than for males in this region.

Brazil (BRA) contributed most to the regional human capital growth, not only for the entire period, but also for the three subperiods as well. As shown in Figure 24, the contribution of Term1, from both males and females in Brazil (BRA), was extremely high during the first subperiod. During the second subperiod, although the contribution of Term1 declined markedly, that of Term2 improved considerably, more from males. During the last subperiod, many factors remained high in Brazil (BRA).

Figure 11 in subsection 3.2 indicates that Chile (CHL) climbed up finally to the 4th place from the 6th place at the beginning, while Cuba (CUB) started from the 11th place, after jumping to the 7th place during the second subperiod, ended up at the bottom among 27 countries in the region. As shown in Figure 24, the small but gradually increasing contribution principally from Term1, and more from females, was behind the Chilean story. On the other hand, it was the substantial contribution increase during the second subperiod, and the much larger contribution decrease during the last subperiod, of Term1, both with more from females, that was behind the Cuban story.

Middle East & North Africa

In this region, the human capital growth over the entire period 1990-2020 was 279.3 %, the highest among all regions. To this high regional growth, Term2 contributed most (190.6 percentage points), more than double that from Term1 (77.4 percentage points). Term3 contributed least (11.3 percentage points). The contributions from different factors were, in descending order, Male Term2 (139.8 percentage points), Female Term2 (50.8 percentage points), Male Term1 (49.2 percentage points), Female Term1 (28.2 percentage points), Female Term3 (12.4 percentage points), and Male Term3 (-1.1 percentage points). In sum, males contributed more than double what females did in this region (187.9 vs. 91.3 percentage points).

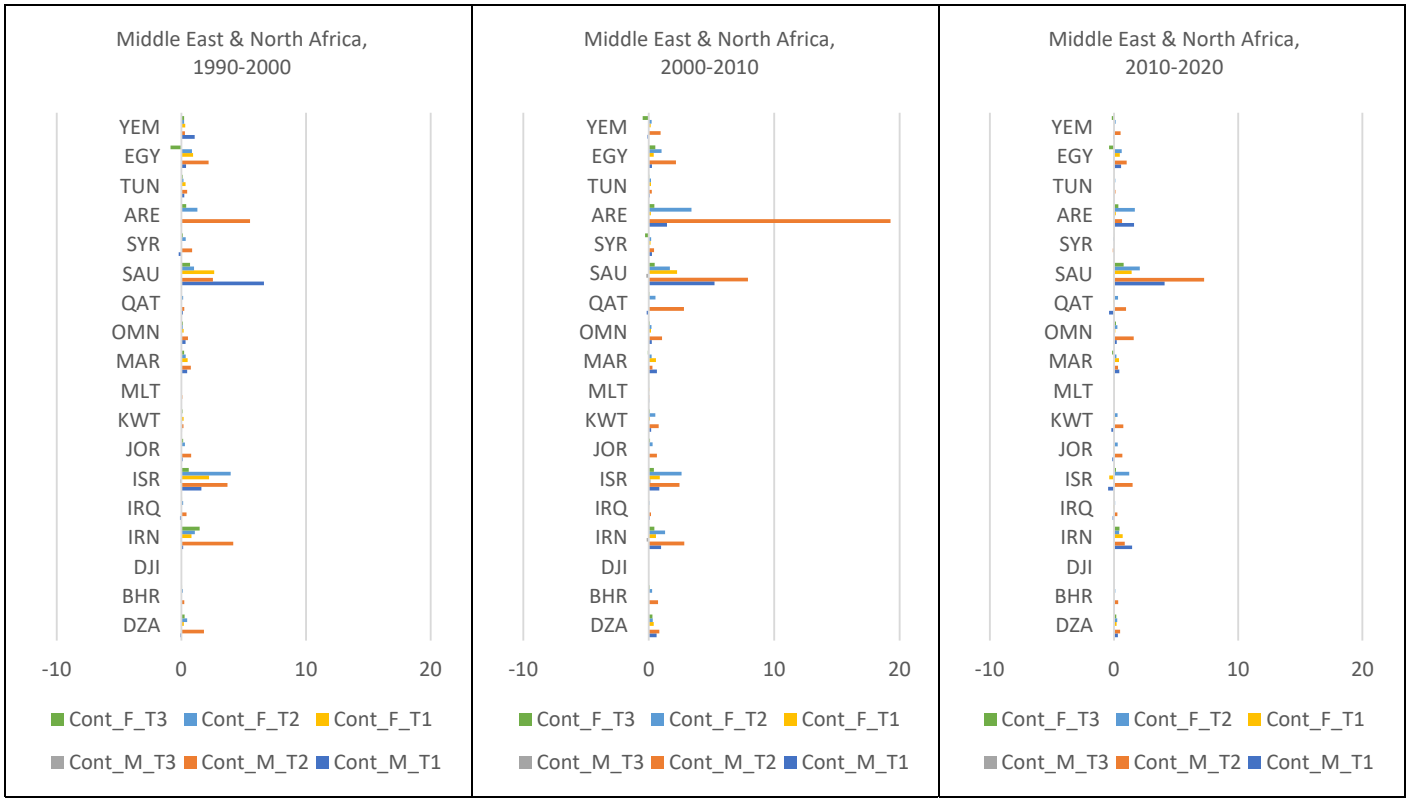
In terms of the contribution to the regional growth, Saudi Arabia (SAU) occupied the 1st place during both the first and last subperiods. United Arab Emirates (ARE) took over the 1st place temporarily during the second subperiod due to its extraordinary performance outpacing Saudi Arabia (SAU). For instance, the contribution from Male Term2 in United Arab Emirates (ARE) was more than double that in Saudi Arabia (SAU) during the second subperiod. However, the marked contribution reduction during the last subperiod in United Arab Emirates (ARE) led it to surrender the 1st place back to Saudi Arabia (SAU) (see Figure 25). Figure 12 in subsection 3.2 has shown that Israel (ISR) fell from the 2nd place at the start to the 6th place in the end, while Oman (OMN) started at the 11th place and ended up at the 4th place among 18 countries/economies in this region. As displayed in Figure 25, the nonstop contribution declining in all Terms in Israel (ISR) was the main reason behind the Israeli story, while the substantial and continuous contribution enhancement from Term2, largely from males, was the main reason behind the Omani story.

Table 6. Country contribution by gender and Terms to regional human capital growth, Middle East & North Africa, 1990-2020 (%)

Country	Code	Male			Female			SUM			
		Term1	Term2	Term3	Term1	Term2	Term3	Term1	Term2	Term3	Total
Middle East & North Africa		***49.2***	***139.8***	***-1.1***	***28.2***	***50.8***	***12.4***	***77.4***	***190.6***	***11.3***	***279.3***
Algeria	DZA	1.4	4.8	-0.1	1.3	1.7	1.2	2.7	6.5	1.1	10.3
Bahrain	BHR	0.1	2.4	0.0	0.2	0.8	0.2	0.2	3.2	0.2	3.7
Djibouti	DJI	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.3
Iran (Islamic Republic of)	IRN	4.7	12.1	-0.3	3.3	4.3	3.8	8.0	16.3	3.5	27.8
Iraq	IRQ	-0.3	1.4	0.0	-0.1	0.5	0.1	-0.4	1.9	0.1	1.6
Israel	ISR	2.3	11.1	0.1	3.3	10.8	1.6	5.6	21.9	1.7	29.1
Jordan	JOR	-0.2	3.5	-0.1	-0.1	1.4	0.4	-0.2	4.9	0.4	5.0
Kuwait	KWT	-0.1	3.2	0.0	0.7	1.5	0.3	0.6	4.7	0.4	5.7
Malta	MLT	0.2	0.2	0.0	0.2	0.1	0.2	0.4	0.4	0.2	0.9
Morocco	MAR	2.6	2.2	-0.1	2.3	1.2	-0.1	4.9	3.4	-0.2	8.1
Oman	OMN	1.7	6.2	0.0	0.9	1.1	0.6	2.5	7.3	0.6	10.5
Qatar	QAT	-0.5	6.6	0.0	-0.1	1.8	0.1	-0.5	8.4	0.1	8.0
Saudi Arabia	SAU	29.4	31.8	-0.5	11.4	8.3	3.4	40.8	40.1	2.9	83.8
Syrian Arab Republic	SYR	0.1	1.4	0.0	0.2	0.5	-0.1	0.4	1.9	-0.2	2.1
United Arab Emirates	ARE	3.9	40.5	0.0	0.5	11.3	2.3	4.4	51.8	2.3	58.4
Tunisia	TUN	0.4	1.1	0.0	0.7	0.6	0.3	1.1	1.8	0.2	3.1
Egypt	EGY	2.1	8.6	-0.1	2.9	4.1	-1.2	5.0	12.7	-1.4	16.4
Yemen	YEM	1.3	2.6	0.0	0.4	0.7	-0.6	1.8	3.3	-0.7	4.4
Maximum		***29.4***	***40.5***	***0.1***	***11.4***	***11.3***	***3.8***	***40.8***	***51.8***	***3.5***	***83.8***
Minimum		***-0.5***	***0.1***	***-0.5***	***-0.1***	***0.0***	***-1.2***	***-0.5***	***0.1***	***-1.4***	***0.3***
Mean		***2.7***	***7.8***	***-0.1***	***1.6***	***2.8***	***0.7***	***4.3***	***10.6***	***0.6***	***15.5***
Median		***0.8***	***3.4***	***0.0***	***0.6***	***1.3***	***0.2***	***1.4***	***4.8***	***0.2***	***6.8***

Source: Authors' own calculations.

Figure 25. Country contribution by gender and Terms to regional human capital growth, Middle East & North Africa, 1990-2000, 2000-2010, and 2010-2020 (%)



Source: Authors' own calculations.

South Asia

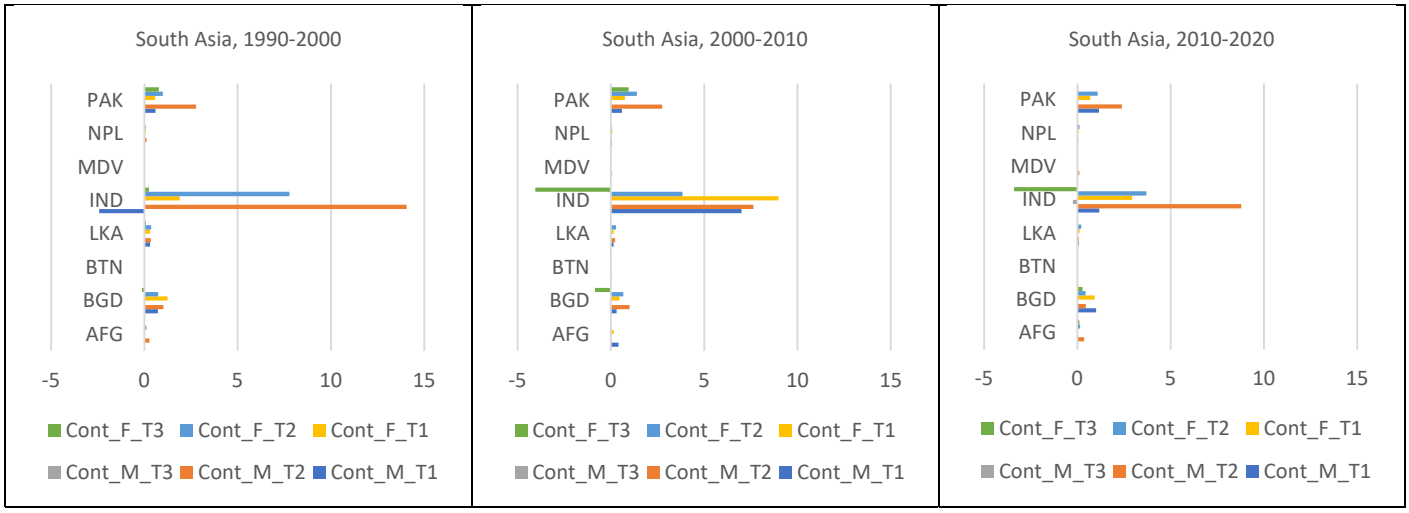
Over the entire period, the human capital growth in this region was 118.0 %. The contribution from Term2 (85.7 percentage points) was more than doubled of that from Term1 (40.1 percentage points). Term 3 reduced the regional growth by 7.8 percentage points. The contributions from different factors were, in descending order, Male Term2 (57.4 percentage points), Female Term2 (28.3 percentage points), Female Term1 (24.9 percentage points), Male Term1 (15.2 percentage points), Male Term3 (-0.4 percentage points), and Female Term3 (-7.4 percentage points). Clearly, males contributed more than females in this region (72.3 vs. 45.8 percentage points) over the entire period 1990-2020.

Table 7. Country contribution by gender and Terms to regional human capital growth, South Asia, 1990-2020 (%)

Country	Code	Male			Female			SUM			
		Term1	Term2	Term3	Term1	Term2	Term3	Term1	Term2	Term3	Total
South Asia		***15.2***	***57.4***	***-0.4***	***24.9***	***28.3***	***-7.4***	***40.1***	***85.7***	***-7.8***	***118.0***
Afghanistan	AFG	0.6	0.9	0.0	0.2	0.4	0.1	0.8	1.4	0.1	2.4
Bangladesh	BGD	2.7	3.3	0.0	3.6	2.5	-0.9	6.3	5.8	-1.0	11.2
Bhutan	BTN	0.1	0.1	0.0	0.1	0.0	0.0	0.2	0.1	0.0	0.3
Sri Lanka	LKA	0.6	0.8	0.0	0.7	1.1	0.1	1.3	1.9	0.1	3.4
India	IND	7.8	40.8	-0.4	17.3	19.3	-9.3	25.2	60.1	-9.6	75.6
Maldives	MDV	0.0	0.3	0.0	0.0	0.1	0.0	0.0	0.4	0.0	0.5
Nepal	NPL	0.1	0.3	0.0	0.3	0.3	0.0	0.5	0.6	0.0	1.1
Pakistan	PAK	3.2	10.9	0.0	2.6	4.6	2.5	5.8	15.4	2.5	23.8
Maximum		***7.8***	***40.8***	***0.0***	***17.3***	***19.3***	***2.5***	***25.2***	***60.1***	***2.5***	***75.6***
Minimum		***0.0***	***0.1***	***-0.4***	***0.0***	***0.0***	***-9.3***	***0.0***	***0.1***	***-9.6***	***0.3***
Mean		***1.9***	***7.2***	***0.0***	***3.1***	***3.5***	***-0.9***	***5.0***	***10.7***	***-1.0***	***14.8***
Median		***0.6***	***0.9***	***0.0***	***0.5***	***0.8***	***0.0***	***1.1***	***1.6***	***0.0***	***2.9***

Source: Authors' own calculations.

Figure 26. Country contribution by gender and Terms to regional human capital growth, South Asia, 1990-2000, 2000-2010, and 2010-2020 (%)



Source: Authors' own calculations.

In this region, India (IND) was dominant, as shown in Figure 26. During the first subperiod, the contribution from Term1 was negative, although that from females was positive; Term2 contributed most, largely from males. During the second subperiod, the contribution from Term1 increased substantially, largely from males, while that from Term2 declined considerably, more from males.

The contribution of Term3 became negative mainly because of a contribution reduction from females. During the last subperiod, the contribution from Term1 reduced significantly, about equally from both males and females, while those of the other factors increased.

Figure 13 in subsection 3.2 indicates that the ranking of the country contribution in this region was quite stable across the three subperiods. Only during the last subperiod interchanged Sri Lanka (LKA) with Afghanistan (AFG), with the place of the former stepping down and that of the latter up among 8 countries/economies in this region. As shown by Figure 26, from the second subperiod to the last, despite a contribution reduction from Term1, those from both Term2 (largely from males) and Term3 (largely from females) improved in Afghanistan (AFG). In contrast, the contributions from both Term1 and Term2, about equally from males and females, declined in Sri Lanka (LKA).

Sub-Saharan Africa

The regional human capital growth over the entire period 1990-2020 was 157.2 %, which came mostly from Term2 (117.0 percentage points), followed by Term1 (32.7 percentage points), and then by Term3 (7.5 percentage points). The contributions from different factors were, in descending order, Male Term2 (61.3 percentage points), Female Term2 (55.8 percentage points), Female Term1 (16.6 percentage points), Male Term1 (16.1 percentage points), Female Term3 (7.7 percentage points), and Male Term3 (-0.2 percentage points). In sum, males contributed less than females in this region (77.1 vs. 80.0 percentage points).

Table 8. Country contribution by gender and Terms to regional human capital growth, Sub-Saharan Africa, 1990-2020 (%)

Country	Code	Male			Female			SUM			
		Term1	Term2	Term3	Term1	Term2	Term3	Term1	Term2	Term3	Total
Sub-Saharan Africa		***16.1***	***61.3***	***-0.2***	***16.6***	***55.8***	***7.7***	***32.7***	***117.0***	***7.5***	***157.2***
Angola	AGO	4.0	6.1	0.2	2.7	6.4	0.5	6.7	12.6	0.7	20.0
Botswana	BWA	0.1	0.4	0.0	0.1	0.5	0.0	0.2	0.9	0.0	1.1
Burundi	BDI	0.1	0.2	0.0	0.1	0.2	0.0	0.2	0.3	0.0	0.6
Cameroon	CMR	0.5	2.0	0.0	0.5	1.7	0.2	1.0	3.7	0.2	4.9
Cabo Verde	CPV	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.2
Central African Republic	CAF	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.2	0.0	0.3
Chad	TCD	0.2	0.8	0.0	0.2	0.7	0.0	0.4	1.4	0.0	1.9
Congo	COG	-0.2	0.9	0.0	-0.1	0.8	0.1	-0.3	1.6	0.1	1.4
Congo, Democratic Republic of the	COD	1.0	2.8	0.0	1.1	2.4	0.0	2.1	5.2	0.0	7.3
Benin	BEN	0.3	0.6	0.0	0.4	0.4	0.0	0.7	1.0	0.0	1.6
Ethiopia	ETH	0.7	1.4	0.0	0.7	1.3	0.1	1.4	2.7	0.1	4.2
Eritrea	ERI	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.2
Gabon	GAB	-0.5	1.6	0.0	-0.4	1.3	-0.1	-0.9	2.8	-0.1	1.8
Gambia	GMB	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.2	0.0	0.3
Ghana	GHA	1.3	2.4	0.0	1.6	1.9	0.0	2.9	4.3	0.0	7.2
Guinea	GIN	0.4	0.4	0.0	0.3	0.4	0.0	0.7	0.9	0.0	1.6
Côte d'Ivoire	CIV	0.4	1.7	-0.1	0.6	1.3	0.1	1.0	3.0	0.0	4.0
Kenya	KEN	-0.2	4.7	0.0	0.0	4.4	0.1	-0.2	9.0	0.2	9.0
Lesotho	LSO	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.2
Madagascar	MDG	0.2	0.7	0.0	0.2	0.7	0.0	0.5	1.4	0.0	1.9
Malawi	MWI	0.2	0.2	0.0	0.2	0.2	0.0	0.3	0.4	0.0	0.8
Mali	MLI	0.4	0.6	0.0	0.3	0.5	0.1	0.7	1.1	0.2	2.0
Mauritania	MRT	0.3	0.6	0.0	0.3	0.3	0.2	0.5	0.9	0.1	1.6
Mauritius	MUS	0.3	0.2	0.0	0.4	0.2	0.1	0.7	0.4	0.1	1.2
Mozambique	MOZ	0.4	0.6	0.0	0.5	0.5	0.0	0.9	1.1	0.0	2.0

Namibia	NAM	0.2	0.6	0.0	0.2	0.7	0.1	0.4	1.3	0.1	1.7
Niger	NER	0.1	0.4	0.0	0.1	0.3	0.1	0.2	0.7	0.1	1.0
Nigeria	NGA	-0.2	4.1	-0.1	0.3	3.1	0.4	0.1	7.2	0.3	7.5
Rwanda	RWA	0.2	0.2	0.0	0.2	0.2	0.0	0.4	0.4	0.1	0.9
Sao Tome and Principe	STP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Senegal	SEN	0.2	0.6	0.0	0.4	0.5	-0.1	0.6	1.2	-0.2	1.6
Sierra Leone	SLE	0.2	0.2	0.0	0.2	0.1	0.0	0.4	0.3	0.0	0.7
Somalia	SOM	0.0	0.2	0.0	0.0	0.1	0.0	-0.1	0.3	0.0	0.3
South Africa	ZAF	4.1	21.2	-0.4	3.9	20.1	5.6	8.0	41.3	5.2	54.5
Zimbabwe	ZWE	0.0	0.4	0.0	0.0	0.5	0.1	0.0	1.0	0.1	1.0
Eswatini	SWZ	0.1	0.2	0.0	0.1	0.1	0.0	0.1	0.3	0.0	0.5
Togo	TGO	0.1	0.3	0.0	0.2	0.2	0.0	0.3	0.4	0.0	0.7
Uganda	UGA	0.2	1.4	0.0	0.3	1.3	0.0	0.5	2.6	0.1	3.2
Tanzania, United Republic of	TZA	0.3	0.8	0.0	0.4	0.8	0.0	0.7	1.7	0.0	2.4
Burkina Faso	BFA	0.3	0.4	0.0	0.3	0.3	0.0	0.6	0.7	0.0	1.3
Zambia	ZMB	0.4	1.0	0.0	0.1	1.1	0.1	0.5	2.1	0.1	2.7
Maximum		***4.1***	***21.2***	***0.2***	***3.9***	***20.1***	***5.6***	***8.0***	***41.3***	***5.2***	***54.5***
Minimum		***-0.5***	***0.0***	***-0.4***	***-0.4***	***0.0***	***-0.1***	***-0.9***	***0.0***	***-0.2***	***0.0***
Mean		***0.4***	***1.5***	***0.0***	***0.4***	***1.4***	***0.2***	***0.8***	***2.9***	***0.2***	***3.8***
Median		***0.2***	***0.6***	***0.0***	***0.2***	***0.5***	***0.0***	***0.4***	***1.0***	***0.0***	***1.6***

Source: Authors' own calculations.

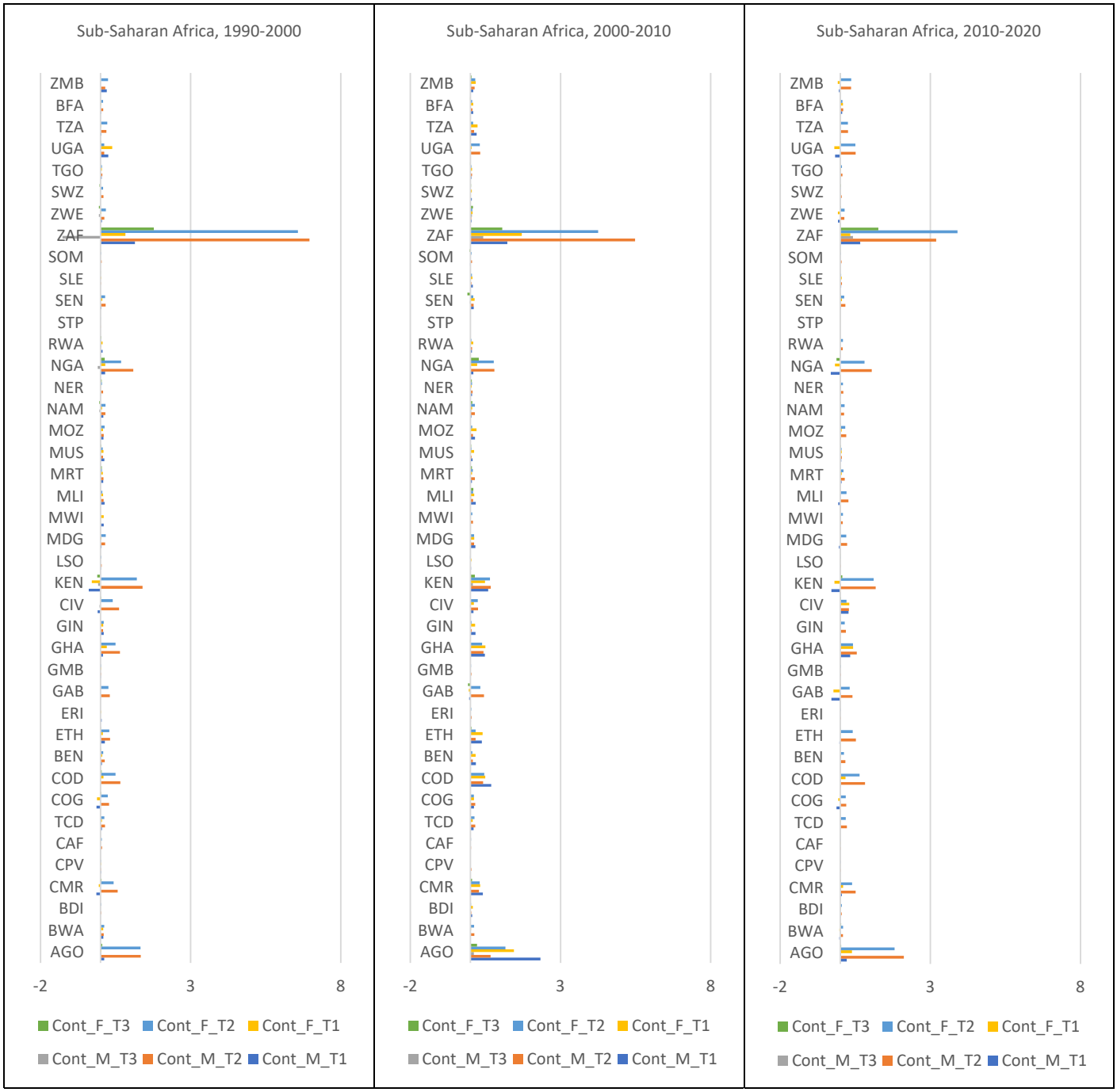
South Arica (ZAF) contributed most to the regional human capital growth over the three subperiods, 1990-2000, 2000-2010, and 2010-2020. In particular, the contributions from Term2, from both males and females, were, though declining, at very high level, if compared with the other countries in the region. The contribution from Term1, increased during the second subperiod, mainly from females, but then declined during the last subperiod, also largely due to females. In addition, the contribution from Term3 increased constantly over the three subperiods, largely from males.

The second largest contribution to the regional human capital growth came from Angola (AGO), which had stayed at the 2nd place among 41 countries/economies in the region across the three subperiods. During the first subperiod, the contribution from Term2 was the largest in Angola (AGO), and equally from males and females. During the second subperiod, the contribution from Term2 declined, more from males this time.

However, the contributions from both Term1 and Term3 increased, with that from Term1 improving dramatically, and largely from males during the second subperiod. The increased contribution from Term3 were equally allocated between males and females. During the last subperiod, the contribution from Term1 dropped substantially, largely from males, and that from Term3 also decreased to some extent, more from females. On the contrary, the contribution from Term2 regained a great uplift, mostly due to males.

Figure 14 in subsection 3.2 shows that Nigeria (NGA) fell from the 3rd place at the beginning to the 6th place in the end, while Chad (TCD) started at the 22nd place but ended up at the 14th place among 41 countries/economies in this region. As shown in Figure 27, it was the downfall of the contributions from Term1, about equally form males and females, and from Term3, largely from females, that mainly explained the Nigerian story, while the main reason behind the Chadian story was the contribution augmentation from Term1, about equally from males and females, during the second subperiod, and that from Term2, largely from females, during the last subperiod.

Figure 27. Country contribution by Terms to regional human capital growth, Sub-Saharan Africa, 1990-2000, 2000-2010, and 2010-2020 (%)



Source: Authors' own calculations.

6. Concluding remarks

Based on the newly established human capital accounts from the IWR project, this chapter provides a comprehensive analysis of the World human capital growth in perspective of region and gender over the period 1990-2020 and the three selected subperiods: 1990-2000, 2000-2010, and 2010-2020. As

a novel and essential factor for human capital estimation, the expected years of schooling are first investigated. Between 1990 and 2020, the expected years of schooling rose for both males and females in all regions, although the detailed increase varied across regions and gender. Among others, the rising expected years of schooling promoted the human capital growth in the World over the observed period.

By 2020, the total human capital in the World, measured in 2015 US$, increased 66.4 % from its level in 1990. The regional growth of human capital varied, however, with the growths in Advanced Economies and Europe & Central Asia below, while those in East Asia & Pacific, Latin America & Caribbean, Middle East & North Africa, South Asia, and Sub-Saharan Africa all above, the World human capital growth for the selected three subperiods.

Considering the three subperiods, the human capital growth in all regions decreased in the last subperiod 2010-2020, if compared with that in the second subperiod 2000-2010, which is a warning signal, calling for possible policy interventions for discontinuing the downward trend of the human capital growth in the World.

Over the selected 1990, 2000, 2010, and 2020, the share in the total World human capital of either Advanced Economies or Europe & Central Asia had monotonically decreased. On the contrary, the other five regions had enjoyed a constantly increased share. However, Advanced Economies still accounted for more than two thirds of the total World human capital in 2020. As a result, over the entire period, Advanced Economies and East Asia & Pacific together accounted for almost three quarters of the World human capital growth, and the rest one quarter was shared by the other five regions, with Latin America & Caribbean having the largest share among them.

By dividing the countries into four income groups, the chapter also shows that the lower income a group had, the higher the human capital growth, and it was true for all the three subperiods. Similarly, it is found that all income groups suffered a decline in the human capital growth from the second to the last subperiod. It is not surprising that the higher income a group had, the more human capital it would possess. However, the share of High-income group, though dominant, had experienced a continuous decrease over 1990, 2000, 2010, and 2020. In contrast, the shares of all the other three income groups had increased constantly over the same period. Nonetheless, the contribution from each income group to the World* human capital growth was positively correlated with its income level, and this was also true for all the three subperiods.

By focusing on individual regions, the chapter displays the country contribution to the regional human capital growth for the entire period, as well as the rank change of the country contribution across the three subperiods. It is well-known that a country's contribution to the regional human capital growth depended not only on its own growth, but also on its share in the total regional human capital stock. It was found that a country's rank in terms of contribution could change across the three subperiods. In East Asia & Pacific, Latin America & Caribbean, and South Asia, the rank of country contribution in general appeared relatively stable, while in Advanced Economies, Europe & Central Asia, Middle East & North Africa, and Sub-Saharan Africa, the rank change sometimes appeared dramatic for some countries.

In terms of human capital by gender, the chapter first presents the estimated annual human capital per capita by gender and region over the period 1990-2020. Between 1990 and 2020, both male and female human capital per capita in almost all regions had increased, though to varied extent. In Advanced Economies and Europe & Central Asia, female human capital per capita was almost always greater than that for males, while in Latin America & Caribbean, Middle East & North Africa, South Asia, and Sub-Saharan Africa, the opposite was true.

The World trend of human capital per capita was predominantly shaped by that in Advanced Economies, which enjoyed the highest human capital per capita for both males and females, followed by Europe & Central Asia, and then by Latin America & Caribbean, with the exception that male human capital per capital in Middle East & North Africa had been larger than that in Latin America & Caribbean since 2009. In East Asia & Pacific, female human capital per capita had been lower than that for males until 2013, and since then the reverse was true. Human capital per capita was very low in South Asia and Sub-Saharan Africa.

To find how human capital is distributed among educated males and females, the Gini gender coefficients are calculated for each region and income group over the period 1990-2020. The estimated results show that Middle East & North Africa had the highest value of Gini coefficients, followed by South Asia, and then by Sub-Saharan Africa. The time series for Latin America & Caribbean and East Asia & Pacific had been intertwined, but both had higher values than those for Advanced Economies and Europe & Central Asia, the latter two being also overlapped for some years. The higher value the Gini coefficient was, the more human capital that was developed/owned by males than females. There was also a general downward trend of the Gini coefficients for all regions, meaning in a broad sense that the distribution of human capital between educated males and females had become evener over time.

The time series of the estimated Gini coefficients for the four income groups indicates that in general, the higher income an income group had, the lower the value of the estimated Gini gender coefficients would be. Over the period 1990-2020, there was a gradual downward trend for the values of Gini coefficients for almost all income groups, except for Low-income group where the Gini coefficients had kept roughly stable until the 'global financial crisis of 2007-2008' occurred and had been presumably pushed up for a couple of years, and then the values went down gradually till 2020.

As for High-income group, the estimated Gini coefficient declined gradually from a positive value in 1990, first becoming negative in 1998, and then dropping further in value until 2020. However, the absolute value increased, implying that after 1998, more and more human capital was developed/owned by educated females than males, in other words, the gender distribution of human capital became more uneven after 1998, but to the favor of educated females rather than educated males in High-income group. This phenomenon can also be observed from the estimated country Gini coefficients as presented for all the four income group countries in the chapter, but more visible for Upper-middle- and High-income group countries.

To identify the sources of the human capital growth within the methodology framework employed by the IWR project for human capital estimation, a general decomposition method is applied in the chapter, which decomposes, separately for each gender, the human capital growth into three factors: 'Education effect' (Term1), which is determined by the expected years of schooling; 'Educated population effect' (Term2), which is determined by the number of educated individuals; and 'Compensation to human capital effect' (Term3), which is practically determined by the expected remained working years.

The decomposition results show that over the three subperiods, females contributed more than males to the World human capital growth. By Terms only, the contribution of Term2 (Educated population effect) was the largest, followed by that of Term1 (Education effect), with the two Terms accounting for more than 97 percent of the World human capital growth, leaving Term3 (Compensation to human capital effect) contributing only a tiny piece.

Over the entire period, the contributions by gender and Terms to the World human capital growth are ranked in descending order as: 'Male Term2', 'Female Term1', 'Female Term2', 'Male Term1',

'Female Term3', and 'Male Term3'. The ranking was roughly the same for the three subperiods. In particular, 'Male Term3' had almost no contribution or even dragged down the World human capital growth since its contribution was non-positive (almost zero or negative). Moreover, it was found that a universal impact, affecting almost all the contributing factors proportionately, was behind the downward change of the human capital growth from the observed second to the last subperiod.

The decomposition framework as outlined in the chapter is sufficiently flexible to be applied widely for various analyses by using the newly established IWR human capital accounts. As an application example, the chapter presents the country contribution by gender and Terms to the regional human capital growth over the entire period, as well as the three subperiods. The rich and detailed quantitative information helped to reveal the specific pattern in terms of contribution factors behind the human capital growth in each region covered in the chapter, which can be used for designing fact-based policy targeting individual countries.

For instance, for countries with low contribution from Term1 (Education effect), policy measures should be taken with the view of increasing the expected years of schooling, while for countries already enjoying very high expected years of schooling, to further improve human capital, policy measures should focus on other factors, e.g., to enhance the compensation to human capital (Term3), by improving labor force participation rates not only for males but also for females, etc.

One observation of the chapter is that the overall contribution from the 'Compensation to human capital effect' (Term3) was rather low, if compared to those from the other two Terms. On the one hand, this finding points out a direction for policy makers to take concrete measures to further improve human capital as suggested above, on the other hand, it reflects the limitation of the current methodology applied by the IWR project for human capital estimation, in which no distinguish has been made for labor compensation between gender and over years, leading to the change of Term3 being practically determined solely by the expected remaining working years.

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Appendix A The list of countries/economies included in the seven regions

Advanced Economies (24 countries/economies): Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom of Britain and Northern Ireland, and the United States of America.

These are the same 24 countries included in the Barro-Lee (2018) data set advanced economies or countries category. The list of countries considered advanced by the International Monetary Fund (IMF) has changed over time; the only country classified as an advanced economy in this chapter that is not in the current IMF list is Turkey. The IMF defines advanced economies or countries using three criteria: the level of per capita income, the extent of export diversification, and the degree of integration into the financial sector into the global financial system. See vfhttps://www.imf.org/external/pubs/ft/weo/faq.htm#q4b.

East Asia & Pacific (20 countries/economies): Brunei Darussalam, Cambodia, China, Fiji, Hong Kong, Indonesia, Korea (Democratic People's Republic of), Korea (Republic of), Lao People's Democratic Republic, Macao, Malaysia, Mongolia, Myanmar, Papua New Guinea, Philippines, Samoa, Singapore, Thailand, Vanuatu, and Viet Nam.

Europe & Central Asia (28 countries/economies): Albania, Azerbaijan, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czechia, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldovia (Republic of), North Macedonia, Poland, Romania, Russian Federation, Serbia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.

Latin America & Caribbean (27 countries/economies): Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Columbia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, and Venezuela (Bolivian Republic of).

Middle East & North Africa (18 countries/economies): Algeria, Bahrain, Djibouti, Egypt, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Malta, Morocco, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia, United Arab Emirates, and Yemen.

South Asia (8 countries/economies): Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka.

Sub-Saharan Africa (41 countries/economies): Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Congo, Congo (Democratic Republic of), Cote d'Ivoire, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Somalia, South Africa, Tanzania (United Republic of), Togo, Uganda, Zambia, and Zimbabwe.

Appendix B The list of countries/economies included in the four income groups

High-income (51 countries/economies): Australia, Japan, New Zealand, Brunei Darussalam, Hong Kong, Republic of Korea, Macao, Singapore, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom of Great Britain and Northern Ireland, Croatia, Cyprus, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia, Bahamas, Barbados, Chile, Trinidad and Tobago, Uruguay, Bahrain, Israel, Kuwait, Malta, Oman, Qatar, Saudi Arabia, United Arab Emirates, Canada, United States of America.

Upper-middle-income (42 countries/economies): China, Fiji, Malaysia, Thailand, Turkey, Albania, Azerbaijan, Armenia, Bosnia and Herzegovina, Bulgaria, Belarus, Georgia, Kazakhstan, Republic of Moldova, Romania, Russian Federation, Serbia, Turkmenistan, North Macedonia, Argentina, Brazil, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, Guatemala, Guyana, Jamaica, Mexico, Panama, Paraguay, Peru, Suriname, Iraq, Jordan, Maldives, Botswana, Gabon, Mauritius, Namibia, South Africa.

Lower-middle-income (49 countries/economies): Myanmar, Cambodia, Indonesia, Lao People's Democratic Republic, Mongolia, Vanuatu, Papua New Guinea, Philippines, Viet Nam, Samoa, Kyrgyzstan, Tajikistan, Ukraine, Uzbekistan, Bolivia (Plurinational State of), Belize, El Salvador, Haiti, Honduras, Nicaragua, Algeria, Djibouti, Iran (Islamic Republic of), Morocco, Tunisia, Egypt, Bangladesh, Bhutan, Sri Lanka, India, Nepal, Pakistan, Angola, Cameroon, Cabo Verde, Congo, Benin, Ghana, Côte d'Ivoire, Kenya, Lesotho, Mauritania, Nigeria, Sao Tome and Principe, Senegal, Zimbabwe, Eswatini, United Republic of Tanzania, Zambia.

Low-income (23 countries/economies): Korea (Democratic People's Republic of), Syrian Arab Republic, Yemen, Afghanistan, Burundi, Central African Republic, Chad, Democratic Republic of the Congo, Ethiopia, Eritrea, Gambia, Guinea, Madagascar, Malawi, Mali, Mozambique, Niger, Rwanda, Sierra Leone, Somalia, Togo, Uganda, Burkina Faso.

Appendix C

Table Bx. Contribution by Term and gender to country human capital growth, 1990-2020 (%)

Country	Code	Male			Female			SUM			
		Term1	Term2	Term3	Term1	Term2	Term3	Term1	Term2	Term3	Total
Afghanistan	AFG	117	170	0	37	82	26	154	252	26	432
Albania	ALB	9	3	0	21	2	3	30	5	3	38
Algeria	DZA	28	94	-3	26	35	24	54	129	21	204
Angola	AGO	52	79	3	36	84	6	87	163	9	259
Azerbaijan	AZE	7	35	0	13	30	4	20	65	4	89
Argentina	ARG	9	26	0	11	30	8	20	55	8	83
Australia	AUS	24	32	0	25	31	3	50	63	3	115
Austria	AUT	11	13	0	19	7	5	31	20	5	56
Bahamas	BHS	-13	40	1	-13	46	2	-26	86	3	63
Bahrain	BHR	9	271	-1	18	94	25	28	365	24	417
Bangladesh	BGD	37	45	0	48	34	-13	85	79	-13	151
Armenia	ARM	6	-6	-1	9	-1	-4	15	-7	-4	3
Barbados	BRB	2	13	0	19	10	1	22	23	1	46
Belgium	BEL	15	10	0	28	5	6	43	15	7	65
Bhutan	BTN	57	48	1	69	22	7	126	69	8	204
Bolivia (Plurinational State of)	BOL	-2	56	0	2	49	6	0	105	6	111
Bosnia and Herzegovina	BIH	24	-14	1	31	-14	6	55	-28	8	34
Botswana	BWA	13	58	1	14	61	4	28	120	5	152
Brazil	BRA	75	29	-1	71	30	8	146	59	7	212
Belize	BLZ	7	94	0	12	80	11	19	174	11	204
Brunei Darussalam	BRN	8	57	-1	11	50	8	19	108	7	134
Bulgaria	BGR	11	-10	0	15	-9	0	26	-20	0	7
Myanmar	MMR	26	19	0	28	22	-7	54	41	-8	88
Burundi	BDI	34	56	1	49	52	1	83	108	2	192
Belarus	BLR	10	0	0	11	0	1	21	-1	1	21
Cambodia	KHM	7	69	1	14	63	2	20	132	3	155
Cameroon	CMR	18	76	0	19	62	6	37	138	6	182
Canada	CAN	-2	26	0	-2	26	3	-4	52	3	50
Cabo Verde	CPV	33	68	-3	33	51	10	65	119	7	191
Central African Republic	CAF	10	40	0	13	32	0	23	73	1	97
Sri Lanka	LKA	13	16	0	15	23	2	28	39	2	69
Chad	TCD	26	95	0	27	82	2	54	177	2	233
Chile	CHL	32	41	0	36	35	15	68	76	15	159
China	CHN	32	19	-1	44	17	-1	76	36	-2	109
Colombia	COL	37	45	0	32	46	23	69	91	23	183
Congo	COG	-21	86	1	-10	75	5	-31	161	6	136
Congo, Democratic Republic of the	COD	29	81	0	33	68	1	61	150	1	212
Costa Rica	CRI	41	58	-1	41	52	19	82	110	19	211
Croatia	HRV	19	-8	0	29	-8	2	47	-16	2	33
Cuba	CUB	10	10	-1	11	10	6	21	20	5	46
Cyprus	CYP	47	40	0	50	41	6	97	81	6	184
Czechia	CZE	18	7	0	31	4	1	49	10	1	60
Benin	BEN	46	83	-1	53	60	6	99	143	5	246
Denmark	DNK	16	5	-1	29	3	-1	45	8	-1	52
Dominican Republic	DOM	26	38	0	35	38	9	61	76	8	144
Ecuador	ECU	1	62	0	2	58	12	3	119	12	134
El Salvador	SLV	12	20	0	13	25	4	25	45	4	73
Ethiopia	ETH	42	84	1	41	74	4	83	157	6	246

Eritrea	ERI	27	28	1	22	29	2	48	57	3	109
Estonia	EST	10	-5	0	24	-8	1	34	-13	0	22
Fiji	FJI	8	24	-1	10	18	10	19	42	9	70
Finland	FIN	10	8	0	15	6	1	25	14	1	40
France	FRA	9	8	0	11	10	3	20	19	3	41
Djibouti	DJI	42	63	2	36	34	34	78	98	36	211
Gabon	GAB	-25	84	-2	-24	67	-6	-49	151	-7	95
Georgia	GEO	9	-12	0	15	-15	0	25	-27	-1	-3
Gambia	GMB	15	78	-2	33	68	-5	48	147	-6	188
Germany	DEU	6	6	1	9	2	4	15	8	5	29
Ghana	GHA	37	69	-1	47	55	-1	84	124	-1	207
Greece	GRC	31	1	-1	28	3	6	59	4	5	68
Guatemala	GTM	16	70	0	22	55	3	38	125	3	166
Guinea	GIN	40	49	-2	38	45	1	77	94	-1	170
Guyana	GUY	11	9	-2	13	4	5	24	13	3	41
Haiti	HTI	4	38	0	6	39	4	11	78	4	93
Honduras	HND	9	81	0	14	72	16	24	153	16	193
Hong Kong	HKG	26	16	-1	30	35	5	57	51	4	112
Hungary	HUN	15	-2	1	20	-2	3	35	-4	3	35
Iceland	ISL	15	22	0	31	22	0	46	44	-1	89
India	IND	11	55	-1	23	26	-13	34	81	-13	102
Indonesia	IDN	18	39	0	23	35	2	41	74	2	117
Iran (Islamic Republic of)	IRN	36	93	-2	25	33	29	61	126	27	214
Iraq	IRQ	-28	135	0	-6	44	6	-34	180	7	152
Ireland	IRL	36	30	-1	43	27	11	79	58	11	147
Israel	ISR	12	58	1	17	56	8	29	114	9	151
Italy	ITA	17	5	-1	22	5	5	40	10	5	54
Côte d'Ivoire	CIV	19	70	-3	25	54	4	43	124	1	168
Jamaica	JAM	-5	23	-1	-5	24	-1	-10	47	-2	36
Japan	JPN	8	6	0	5	7	3	13	13	3	28
Kazakhstan	KAZ	14	7	0	14	9	1	28	16	1	45
Jordan	JOR	-9	187	-3	-4	77	22	-13	264	19	270
Kenya	KEN	-3	92	1	0	85	3	-4	178	3	177
Korea (Democratic People's Republic of)	PRK	-13	22	0	-10	21	0	-23	43	0	20
Korea, Republic of	KOR	18	28	0	20	23	4	38	51	4	93
Kuwait	KWT	-2	110	1	22	49	11	21	160	12	193
Kyrgyzstan	KGZ	8	29	0	6	30	-5	13	59	-5	67
Lao People's Democratic Republic	LAO	23	49	1	31	42	1	54	91	2	147
Lesotho	LSO	19	26	-1	20	15	-1	39	41	-2	79
Latvia	LVA	19	-16	-1	25	-17	0	43	-33	-1	9
Lithuania	LTU	13	-13	0	29	-15	1	42	-27	1	16
Luxembourg	LUX	22	40	0	18	33	11	40	72	11	124
Macao	MAC	19	71	1	38	72	11	57	143	12	212
Madagascar	MDG	24	77	1	25	76	1	49	153	2	204
Malawi	MWI	35	45	1	38	47	2	72	92	4	168
Malaysia	MYS	15	69	0	20	57	6	36	125	5	167
Maldives	MDV	1	256	0	23	76	27	23	332	28	383
Mali	MLI	42	75	5	36	59	16	78	134	20	232
Malta	MLT	19	26	0	28	17	21	47	43	21	110
Mauritania	MRT	42	90	-3	41	51	25	84	142	22	247
Mauritius	MUS	27	20	-1	32	18	8	58	38	8	104
Mexico	MEX	21	48	-1	25	42	11	46	90	10	146
Mongolia	MNG	32	33	1	33	37	1	65	70	2	137
Moldova, Republic of	MDA	-1	6	-4	-2	4	-5	-3	10	-9	-2
Morocco	MAR	50	42	-1	44	23	-2	94	64	-3	155

Mozambique	MOZ	45	62	2	53	59	1	98	121	3	223
Oman	OMN	91	341	-1	49	61	35	139	402	35	576
Namibia	NAM	13	47	0	16	52	6	30	99	6	134
Nepal	NPL	18	37	0	45	43	2	62	80	2	144
Netherlands	NLD	16	9	0	23	7	6	38	16	7	61
Vanuatu	VUT	11	61	0	13	60	-2	24	120	-2	142
New Zealand	NZL	15	26	0	27	27	3	42	53	4	98
Nicaragua	NIC	23	52	0	20	50	11	43	103	12	157
Niger	NER	36	124	0	30	88	42	66	212	43	320
Nigeria	NGA	-3	69	-2	4	52	6	2	121	5	127
Norway	NOR	16	16	0	27	12	0	42	28	0	70
Pakistan	PAK	26	88	0	21	37	20	47	126	20	193
Panama	PAN	7	54	0	10	51	11	16	106	11	133
Papua New Guinea	PNG	46	49	-8	38	46	-7	84	94	-15	163
Paraguay	PRY	23	55	0	28	47	4	51	102	4	157
Peru	PER	28	51	0	24	45	10	52	96	10	158
Philippines	PHL	14	55	-1	13	53	0	27	109	-1	135
Poland	POL	13	6	0	24	7	0	37	13	0	51
Portugal	PRT	23	4	-1	27	6	3	50	11	3	64
Qatar	QAT	-34	477	0	-4	129	7	-38	606	7	575
Romania	ROU	9	-6	0	13	-5	0	22	-11	0	11
Russian Federation	RUS	13	1	0	15	2	0	28	3	-1	30
Rwanda	RWA	38	44	7	49	41	10	87	85	17	188
Sao Tome and Principe	STP	20	53	0	22	43	5	43	97	5	145
Saudi Arabia	SAU	155	167	-3	60	44	18	215	211	15	441
Senegal	SEN	21	66	-4	37	56	-13	59	122	-16	164
Serbia	SRB	26	-4	0	34	-4	4	60	-8	4	56
Sierra Leone	SLE	43	40	3	51	29	4	94	69	7	171
Singapore	SGP	11	73	0	20	59	9	30	132	9	172
Slovakia	SVK	11	9	0	17	9	0	28	18	-1	46
Viet Nam	VNM	9	40	0	16	36	0	25	76	-1	100
Slovenia	SVN	25	6	2	39	2	4	63	7	5	76
Somalia	SOM	-17	74	1	-5	46	-8	-22	120	-6	92
South Africa	ZAF	9	48	-1	9	46	13	18	94	12	124
Zimbabwe	ZWE	-1	22	1	0	28	4	-1	49	5	53
Spain	ESP	22	18	-1	25	17	12	47	35	11	93
Suriname	SUR	3	30	-1	4	33	-1	7	63	-3	67
Eswatini	SWZ	15	41	-1	16	29	7	30	69	6	105
Sweden	SWE	16	9	0	34	5	-1	50	14	-1	63
Switzerland	CHE	10	19	0	19	16	2	30	35	2	66
Syrian Arab Republic	SYR	6	63	-1	11	23	-6	18	86	-8	96
Tajikistan	TJK	-5	57	-5	0	41	-15	-5	98	-20	74
Thailand	THA	40	17	-1	46	24	-2	86	41	-3	123
Togo	TGO	27	68	-3	40	51	-2	67	119	-5	181
Trinidad and Tobago	TTO	10	20	0	10	19	8	20	39	7	66
United Arab Emirates	ARE	49	513	0	6	143	28	55	655	29	739
Tunisia	TUN	16	49	-1	31	28	12	47	78	10	135
Turkey	TUR	58	46	-2	60	31	1	118	77	-1	194
Turkmenistan	TKM	18	45	-1	12	43	-2	30	88	-3	115
Uganda	UGA	11	89	2	22	82	2	33	171	4	207
Ukraine	UKR	12	-6	-1	10	-6	-2	22	-12	-3	8
North Macedonia	MKD	15	9	0	18	7	4	33	16	4	53
Egypt	EGY	16	65	-1	22	31	-9	38	97	-10	125
United Kingdom of Great Britain and Northern Ireland	GBR	15	11	0	22	8	1	37	19	1	56

Tanzania, United Republic of	TZA	26	65	1	28	65	2	54	130	3	186
United States of America	USA	6	19	0	7	19	1	13	39	1	52
Burkina Faso	BFA	45	65	-1	51	54	-2	96	119	-3	212
Uruguay	URY	9	9	0	7	11	4	16	19	4	39
Uzbekistan	UZB	6	56	0	6	48	0	11	104	0	116
Venezuela (Bolivarian Republic of)	VEN	22	33	-1	22	36	3	44	70	3	117
Samoa	WSM	13	11	-4	7	10	-5	20	21	-8	32
Yemen	YEM	66	133	-1	22	35	-33	88	168	-34	222
Zambia	ZMB	23	62	2	9	74	3	32	136	5	173

Source: Authors' own calculations.