THE IMPORTANCE OF HIGHER EDUCATION ON ECONOMIC GROWTH

Avraham Cohen*

Abstract

It is very important for countries to stimulate their economic prosperity and reduce poverty. While it is commonly accepted that education of all forms enhances economic performance of a country, yet the question of which level of education, secondary or tertiary, is more important to fuel the economy is not conclusively answered.

The finding in Avraham Cohen's PhD thesis is that education, as measured by published research, is strongly associated with Artificial Intelligence index of countries. Also, he found that AI is strongly associated with GDP. His findings encourage the idea that higher education, which is needed for Artificial Intelligence (AI), will be a dominant factor for economic growth in general; hereby, policy makers should investment in higher education to ensure economic affluence.

Enrollment rates for higher education in Sub-Saharan Africa are by far the lowest in the world and the academic research output in the region is among the world's lowest. Because of a belief that primary and secondary schooling are more important than tertiary education for poverty reduction, the international development community has encouraged African governments' relative neglect of higher education.

Using methodology of fuzzy logic-based soft regression, this study challenges these beliefs and demonstrates that economic growth is almost exclusively determined by higher education. Also, the importance of higher education relative to secondary education is more so in recent years relative to a decade or two ago.

Motivated by this finding, I propose to find the right branch of higher education for every country based on its economic competitive advantage that will impact its economic growth best.

Keywords: *Education, Economic Growth, Artificial Intelligence, fuzzy logic, soft regression*

Introduction

It is a long and important question that policy makers have to decide when allocating resources for education. Simply stated: to which level of education more resources should be allocated, to secondary education or tertiary level, to stimulate economic growth and prosperity while reducing poverty in a country?

Enrollment rates for higher education in Sub-Saharan Africa are by far the lowest in the world at 6%. Yet, stated by Bloom, because of conventional beliefs that tertiary education is less important for poverty reduction, the international development community has encouraged African governments' relative neglect of higher education.[1]. (Friedman & Friedman, 1980) claimed that there was no evidence to suggest that "higher education yields 'social benefits' over and above the benefits that accrue to the students themselves.". Moreover, they hypothesized that higher education may promote "social unrest and political instability".

---

[1] David Bloom, David Canning, Kevin Chan, & David Luca, "Higher education and economic growth in Africa" in *International Journal of African Higher Education*, no.1, vol. 1, 2014, pp. 22-57.

At the same time, Marquez-Ramos and Mourelle,[2] in their research conclude: "The results show that both secondary and tertiary education matter for economic growth". Similarly, Zhang[3] found ambivalent results on the importance of higher education stating: "The study found a fluctuating economic growth indicator during the research period … the result of the sub-sample showed a heterogeneous effect on high GDP per capita countries".

The above findings which cover the last few decades, are troubling for not finding clear-cut result showing the importance of higher education. Tertiary education organizations are at the center of the large revolutions required throughout cost-cutting and civilizations. Tertiary education is essential for the development of human capital and innovation. As the world seeks to advance toward a new age of green and fair economic growth, operational and strategic investments in tertiary education can serve the poorest to the richest countries by increasing its skills, capacity and leadership, creating, and spreading knowledge to local and global encounters, and partaking in the global knowledge economy. Operative tertiary education segments guarantee that countries have well-trained professional engineers, technicians, teachers, doctors, nurses and managers who are the core actors of effective education delivery for private and public sectors development. Mogas in her study claimed that years of inadequate and fruitless investment in post-secondary education and the advanced skills advanced through higher learning opportunities have only intensified global equity gaps[4].

Therefore, to reach a conclusive and robust result on this issue, the main hypothesis of this study is:

[2] Laura Marquez-Ramos., & Estefanía Mourelle , "Education and economic growth: an empirical analysis of nonlinearities", in Applied Economic Analysis.

[3] Dongyang Zhang., Rasheed Abdul Khaliq., & Chang Youngho. "Public spending and green economic growth in BRI region: mediating role of green finance", in *Energy Policy*.

[4] Recalde Jordi Mogas., Palau Ramon & Bernat Gisela Cebrián. , "Smart schools on the way: How school principals from Catalonia approach the future of education within the fourth industrial revolution", in *Learning Environments Research*, no. 25, vol. 3, 2022, pp. 875-893.

Hypothesis: "Secondary education is more important than tertiary education to stimulate the economy."

In this paper, I focused on large-scale, cross-country study of over 150 countries. To substantiate the result and find a trend in the importance of higher education for economic growth, the study includes three periods 2000, 2007 and 2014. Furthermore, to overcome many limitations of other studies which use variation of Multi Variant Regressions (MVR), this study provides an extensive sample analysed with well-established methodology of fuzzy logic-based soft regression as outlined by Eli Shnaider and Arthur Yosef [5] and implemented by Avraham Cohen[6]. Determining the relative importance (weight) of secondary and higher education to be adopted by countries (the explanatory variables in this study) is an important and challenging task. The ability to determine relative importance of these education levels and the reliability of such outcome are of ultimate importance to the policy makers, who apply such models as components of decision support or decision making. Soft regression is definitely more reliable and consistent tool to determine relative importance of explanatory variables then traditional method of multiple linear regression as described by Eli Shnaider and Arthur[7].

Needless to say, that a primary and secondary education is a must in modern society as stated by Boland[8]. My findings show that secondary and higher education are important for economic growth. Yet, higher education is substantially more important than secondary education to ensure economic prosperity. Moreover, this study shows that the importance of higher

---

[5] Eli Shnaider. & Arthur Yosef, "Relative importance of explanatory variables: Traditional method versus soft regression" in *International Journal of Intelligent Systems*, no. 33, vol. 6, 2018, pp. 1180-1196.

[6] Avraham Cohen, "The Impact of Artificial Intelligence in Cyberspace on Geopolitics International relations", Ph.D Dissertation in Diplomacy at the Cyber 'Hidden War' Era

[7] Eli Shnaider. & Arthur Yosef, "Utilizing Intervals Of Values In Modeling Due To Diversity Of Measurements", in *Fuzzy Economic Review*, no. 23, vol. 2, 2018.

[8] Theo Boland , "The importance of being literate: Reading development in primary school and its consequences for the school career in secondary education", in *European Journal of Psychology of Education*, no.8, 1993, pp. 289-305.

education relative to secondary education is growing over time. In fact, it is safe to say that in recent years only higher education is relevant for economic growth.

Literature review

The theoretical foundations of the economic effects of better education were laid out in the seminal contributions of Schultz[9], Becker[10] and Mincer[11]. Bradley and Green[12] provide an excellent up-to-date overview of research in the economics of education. The work of Baker and Mincer developed the theory of human capital based on individuals investing in their own education in a way that is analogous to physical capital, and at the same way, generates a stream of future returns. Their work generated an enormous amount of research in the field of human capital.

The search for evidence that tertiary education is essential for economic prosperity, also, goes back several decades. Friedman & Friedman[13] concluded that there was no evidence to suggest that "higher education yields 'social benefits' over and above the benefits that accrue to the students themselves." Likewise, Wolff[14] revealed that the number of higher education graduates does not significantly affect economic productivity. Similarly, Vedder[15] conducted research on US States, found that states with greater public expenditures on higher education did not obtain more economic growth in

[9] Theodore Schultz, "Investment in Human Capital", in *American Economic Review*, Vol. 51, 1961, pp. 1-17

[10] Gary Becker, "Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education" in *National Bureau of Economic Research*.

[11] Jacob Mincer, "Schooling, Experience, and Earnings", in *NBER*.

[12] Steve Bradley. and Colin Green, "the Economics of Education: A Comprehensive Overview", in 2nd edition, Academic Press, London

[13] Milton Friedman and Rose Friedman, "Free to choose: a personal statement", in New York: Harcourt Brace Jovanovich.

[14] Edward N. Wolff, "The role of education in the postwar productivity convergence among OECD countries" in *Industrial and Corporate Change*, no. 10, vol. 3 ,2001, pp. 735-759.

[15] Richard K. Vedder, "Going broke by degree: Why college costs too much" in American Enterprise Institute.

the US. In the same group of researchers, Guo and Jia[16] constructed a two-step human capital accumulation model and observed that compared to primary education, the effect of higher education on economic productivity is ambiguous.

Other studies try to come up with explanation of these results and show their inconsistency. Birdsall[17] argue that higher education could increase employment and improve the safety of society, and any results that do not consider these points are biased. According to Hanushek[18], extending the years of education without improving human capital does not influence economic productivity. Lastly, Di, Sun and Ning revealed that different types of higher education have distinct impacts on economic efficiency and growth. Overall, the overwhelming majority of the literature has discussed education in general, but few studies have distinguished among various higher education levels.

More recent research studies have had the same difficulty to reach conclusive conclusion as to the importance of higher education relative to secondary education. Marquez-Ramos and Mourelle concluded that both secondary and tertiary education matter for economic growth. They have not attempted to measure the importance of each of these education levels on economic prosperity of a country. The same could be said on the study of Zhang. His findings were ambivalent on the importance of higher education.

Rahman[19] analyze empirically the contribution of tertiary level education by fields on economic growth for developed and developing countries. They found that in the developed countries graduates from science faculties make the most contribution to economic growth, but in

---

[16] Guo Quan & Jia Jia, "Public education policy, economic growth and human capital premium", in *Economic Research Journal*, no. 44, vol. 10, 2009, pp. 22-35.

[17] Nancy Birdsall, "Public spending on higher education in developing countries: too much or too little?", in *Economics of Education Review*, no. 15, vol. 4, 1996, pp. 407-419.

[18] Eric Hanushek, "Will higher education improve economic growth?", in *Oxford Review of Economic Policy*, no. 32, vol. 4, 2016, pp. 538-552.

[19] Tashmina Rahman, Shiro Nakata, Yoko Nagashima, Mokhlesur Rahman, Uttam Sharma, & Muhammad Rahman Asahabur, "Bangladesh tertiary education sector review"

developing countries graduates from education, humanities and social sciences faculties contributed the most to economic growth. Also, they found that, having human capital from different fields in both developed and developing countries positively affects economic growth.

Enrollment rates for higher education in Sub- Saharan Africa are by far the lowest in the world. Currently, the gross enrollment ratio in the region stands at only 6 percent. Many African countries struggle to maintain even low enrollment levels, and the academic research output in the region is among the world's lowest. Because of a belief that primary and secondary schooling are more important than tertiary education for poverty reduction, the international development community has encouraged African governments' relative neglect of higher education. For example, Gyimah-Brempong reported that from 1985 to 1989, 17 percent of the World Bank's worldwide education-sector spending was on higher education. But from 1995 to 1999, the proportion allotted to higher education declined to just 7 percent[20].

In this study I demonstrate that higher education is substantially more important than secondary education to ensure economic prosperity and this relative importance is growing over time. Therefore, I recommend that African countries should increase their investment in higher education to reduce poverty and increase economic growth.

Data and Research methodology

The data utilized in this research were downloaded mostly from the World Bank database. Some of the data series appear more than once because each time such data were downloaded, the values were different for the same year. There are following reasons for the difference in values:

---

[20] Kwabena Gyimah-Brempong, Oliver Paddison & Workie Mitiku, "Higher education and economic growth in Africa", in *The Journal of Development Studies*, no. 42, vol. 3, 2006, pp. 509-529.

(1) The base years for measurements in constant US dollars were different.

(2) Changes of definitions for measuring any given data series took place several times. The timing of such changes has been unpredictable, and when new definition was applied, all the data for previous periods were deleted from the database, thus causing loss of information.

(3) Since not all countries responded immediately to new definitions, for some countries no new data appeared, while old data were deleted, which means that in different downloads, the set of countries is not the same.

It should be kept in mind, that Soft Regression is a soft computing tool that is designed in the first place to handle imprecise (in terms of definition and measurement) data, and therefore is appropriate tool for utilization of different data series that supposedly measure the same thing. Utilizing as many data series (representing the same factor) as possible increases the amount of countries analyzed and increases confidence in model's conclusions.

Table 1 describes the variables used in this study and the number of estimators used to estimate the range of each one of the three variables. In Appendix A, a complete description of every estimator is given.

One of the common methods to show relationship of explanatory variables to a dependent variable is Multi Variable Regression (MVR). As we see below, this method could not be used here due to the existence of high correlation among the two explanatory variables, secondary and tertiary education. Hence, to answer the research questions in this study, the fuzzy logic-based soft regression (SR) is being used to show the relationship between the secondary and tertiary education and the Gross Domestic Product (GDP). The SR methodology implemented in this paper is similar to the methodology described in chapter 9 in (Cohen 2023). Cohen implemented the SR methodology to show the relationship between

the investment of a country in Artificial Intelligence (AI) and its powers such as its military, education, resources and others.

Table 1. Description of variables and composite of its estimators[21]

Variables	Description	Source
GDP	For 2014 there are 10 estimators For 2007 there are 16 estimators For 2000 there are 20 estimators	World Bank BarroLeeDataset
Secondary Education	For 2014 there are 3 estimators For 2007 there are 3 estimators For 2000 there are 4 estimators	World Bank BarroLeeDataset
Tertiary Education	For 2014 there are 3 estimators For 2007 there are 3 estimators For 2000 there are 4 estimators	World Bank BarroLeeDataset

Fuzzy logic-based soft regression is a modeling tool based on soft computing concepts. The important features of the preferred SR compared to the traditional multivariate regression (MVR) when building a model characterized by interrelated variables are:

1. Soft regression does not require precise model specification for reliable results.
2. The interrelation of the variables and their relative importance among themselves are not affected by adding or removing additional variables to/from the model.
3. Variables are not required to be independent of each other.

---

[21] Robert Barro., Lee J. Wha , BarroLeeDataset
https://barrolee.github.io/BarroLeeDataSet/DataLeeLee.html

4. There are no technical problems that could cause distortions in the model. If logical integrity is maintained during the construction of the model - the model will be reliable.

Based on the Fuzzy methodology, all variables are normalized and outliers are removed. In the first normalization stage, values equal to or greater than the max cut were converted to 1, values equal to or lower than low cut were converted to 0 and values between the min and max cuts were converted to numbers between 0 to one. This normalization stage removes outliers; this normalization process is formally given in Cohen section 9, Equation 1. This process of normalization makes all the vectors in a group of estimators of a variable to be comparable and it removes outliers in an estimator. To utilize equation 1, I used the average of Low-Income Countries for the Min Cut and the average for High-Income Countries for the Max Cut.

After preparing the variables, a range reduction process was used to moderate to a large extent the measurement of each of the three variables for a specific country. First, for each country estimators that are too close are compared and one of them is removed using the process described in Cohen for equation 3. Second, if there are more than 4 estimators for a country additional reduction is done using equation 4 and 5 in Cohen, These two processes ensure that there will not be close estimators for a specific country. Finally, countries which still have a large range of estimating a variable were removed to avoid measurement error.

As the last stage in data preparation to estimate a range for each of my variable, I take the minimum value and the maximum value for every country for every variable. Putting these in one table of six columns (vectors) presented in Appendix A.

The next stage is to find the similarity or closeness of every education type (secondary and tertiary) to the GDP is calculated using Cohen equation 13. I estimated four different possibilities: using the minimum estimation of

GDP with the minimum and maximum estimation of secondary and tertiary education and using the maximum estimation of GDP with the minimum and maximum estimation of secondary and tertiary education. Then, the collective contribution of the two explanatory variables in combination with the explanation of the behavior of the dependent variable (GDP) is calculated using Cohen equation 15. Finally, to answer the research question, the adjusted contribution is calculated, Cohen equation 17 (multiplied by the SComb estimation), and the Relative Importance (RI) of every education type, Cohen equation 16, in explaining the GDP are calculated.

To confirm that a traditional MVR will fall to estimate the importance of the various variables, I computed the correlation matrix of the two explanatory variables for the three periods. All the correlations are very high, higher than 0.8, and the results are presented in Table 2. The high correlation of secondary and tertiary education in all three periods indicate the existent of multi-co-linearity problem and will cause that the coefficient estimation in a MVR to be non-significant.

Table 2. *Correlation between the secondary education and tertiary education variables in three periods.*

	2014	**2007**	**2000**
Correlation	0.815	0.825	0.858

Results and Discussion

After the preprocessing stage, I calculated the similarity of the two education variables and the net GDP variable using equation 13 in Cohen section 9. These calculations are presented in table 3. In addition, I calculated the combined similarity (SComb) index, using equations 14 and 15 in Cohen section 9 which is presented in the last row for every period of table 3.

Several important findings presented in the similarity table. First, the secondary education is barely significant (around 0.7) in 2000 but not significant for the years 2007 and 2014. On the other hand, tertiary education is always strongly significant (around 0.8 or above) for all the periods.

Table 3. Similarity and combined similarity.

		mm	mx	Xm	xx
	Tertiary	0.78	0.77	0.84	0.83
2014	**Secondary**	0.62	0.60	0.71	0.69
	SComb	0.79	0.77	0.85	0.84
	Tertiary	0.78	0.78	0.83	0.82
2007	**Secondary**	0.67	0.64	0.73	0.70
	SComb	0.81	0.79	0.85	0.84
	Tertiary	0.81	0.79	0.84	0.82
2000	**Secondary**	0.74	0.66	0.79	0.72
	SComb	0.84	0.81	0.88	0.84

The same conclusion could be seen in calculating relative importance of the two education variables which are presented in Table 4.

The combined similarity (SComb) index was utilized to measure the relative importance of every education type relative to the other. This index is a combination of the two educations. It was constructed as follows: for every country, the value of the education type which is the closest to the GDP variable was used. This construction of an index ensures that it will be closer to the GDP variable than any of the education variables. The "Similarity Combo" is composed of most or might be all both variables. By finding the contribution of each education variable to this combined similarity index, the importance of each education variable relative to the other in explaining the GDP variable was found.

The findings in table 4 are straight forward. The relative importance of tertiary education is substantially higher than the contribution of secondary education in all the periods. Moreover, this significant relative importance is increasing from 2000 to 2014.

The results of this section are unambiguous and reject the hypothesis I stated in the introduction: "Secondary education is more important than tertiary education to stimulate the economy." In fact, it is safe to say that tertiary education exclusively determines economic status of a country.

Table 4. Relative Importance.

		mm	mx	xm	Xx
2014	Tertiary	1	1	0.8003	0.8999
	Secondary	0	0	0.1997	0.1001
2007	Tertiary	0.9568	1	0.7025	0.8148
	Secondary	0.0432	0	0.2975	0.1851
2000	Tertiary	0.6806	1	0.5924	0.76437
	Secondary	0.3194	0	0.4076	0.23563

Conclusions:

It is commonly accepted in the academic community that human capital is an essential resource to stimulate economic growth and some argue that it is even more important than physical capital. While some previous research raised the question of the importance of secondary education relative to tertiary education there was not a conclusive answer and some policy makers have advocated to increase primary and secondary education in Africa with the belief that they will increase economic growth.

This study contributes to the topic of human capital and economic growth by introducing a well-established methodology fuzzy logic-based soft regression to rank the importance of education levels in which

countries should invest to ensure economic prosperity and poverty reduction. This robust methodology provides unambiguous results which opens the door for many other future research studies.

The results of this study are clear-cut that tertiary education is the engine for economic growth. The results are strongly significant showing the importance of tertiary education relative to secondary in increasing economic growth for all the periods of the study 2000, 2007 and 2014. Furthermore, its relative importance is increasing over time. This can be explained by the fact that primary and secondary education become necessary education levels in modern society. Yet, it is not enough to create competitive advantage and develop innovative skills.

Inspired by this finding, I recommend future research focusing on matching specific higher education fields that a country should promote to achieve economic competitive advantage based on its resources and geographic location.

Bibliography:

1. Barro Robert., Lee J. Wha (2016), BarroLeeDataset
   https://barrolee.github.io/BarroLeeDataSet/DataLeeLee.html
   Becker Gary (1964), "Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education" in *National Bureau of Economic Research*.
2. Birdsall, Nancy. (1996), "Public spending on higher education in developing countries: too much or too little?", in *Economics of Education Review*, no. 15, vol. 4, 1996, pp. 407-419.
3. Bloom, David. E., Canning, David., Chan, Kevin. J., & Luca, David. L. (2014), "Higher education and economic growth in Africa" in *International Journal of African Higher Education*, no.1, vol. 1, 2014, pp. 22-57.

4. Boland, Theo. (1993), "The importance of being literate: Reading development in primary school and its consequences for the school career in secondary education", in *European Journal of Psychology of Education*, no.8, 1993, pp. 289-305.

5. Bradley Steve. and Colin Green (eds.) (2020), "the Economics of Education: A Comprehensive Overview", in *2nd edition, Academic Press, London*

6. Cohen Avraham. (2023), "The Impact of Artificial Intelligence in Cyberspace on Geopolitics International relations", Ph.D Dissertation in *Diplomacy at the Cyber 'Hidden War' Era*

7. Friedman, Milton. and Friedman, Rose (1980), "Free to choose: a personal statement", in *New York: Harcourt Brace Jovanovich*.

8. Guo Quan., & Jia Jia. (2009), "Public education policy, economic growth and human capital premium", in *Economic Research Journal*, no. 44, vol. 10, 2009, pp. 22-35.

9. Gyimah-Brempong Kwabena., Paddison Oliver., & Mitiku Workie. (2006)., "Higher education and economic growth in Africa", in *The Journal of Development Studies*, no. 42, vol. 3, 2006, pp. 509-529.

10. Hanushek Eric. (2016), "Will higher education improve economic growth?", in *Oxford Review of Economic Policy*, no. 32, vol. 4, 2016, pp. 538-552.

11. *International Dollar Geary-Khamis Defined, Examples Explained. Business Case Website,*
https://www.business-case-analysis.com/international-dollar.html

12. Jordi Mogas Recalde, Ramon Palau & Gisela Cebrián Bernat. (2022), "Smart schools on the way: How school principals from Catalonia approach the future of education within the fourth industrial revolution", in *Learning Environments Research*, no. 25, vol. 3, 2022, pp. 875-893.

13. Marquez-Ramos Laura, & Mourelle E Estefanía. (2019), "Education and economic growth: an empirical analysis of nonlinearities", in *Applied Economic Analysis*.

14. Mincer Jacob. (1974), "Schooling, Experience, and Earnings", in *NBER*

15. Rahman Tashmina, Nakata, Shiro., Nagashima Yoko., Rahman Mokhlesur., Sharma, Uttam & Rahman Muhammad Asahabur. (2019), "Bangladesh tertiary education sector review"

16. Richard K. Vedder. (2004), "Going broke by degree: Why college costs too much" in *American Enterprise Institute*.

17. Schultz Theodore. (1961), "Investment in Human Capital", in *American Economic Review*, Vol. 51, 1961, pp. 1-17.

18. Shnaider Eli. & Yosef, Arthur., (2018) "Relative importance of explanatory variables: Traditional method versus soft regression" in *International Journal of Intelligent Systems*, no. 33, vol. 6, 2018, pp. 1180-1196.

19. Shnaider Eli. & Yosef Arthur., (2018), "UTILIZING INTERVALS OF VALUES IN MODELING DUE TO DIVERSITY OF MEASUREMENTS", in *Fuzzy Economic Review*, no. 23, vol. 2, 2018.

20. Wolff Edward. (2001), "The role of education in the postwar productivity convergence among OECD countries" in *Industrial and Corporate Change*, no. 10, vol. 3 ,2001, pp. 735-759.

21. Zhang Dongyang., Abdul Khaliq Rasheed., & Youngho Chang. (2021), "Public spending and green economic growth in BRI region: mediating role of green finance", in *Energy Policy*.

Appendix:

A. Range estimation for the three periods: 2000, 2007, 2014

	2000						2007						2014					
	Seco.		Ter.		GDP		Seco.		Ter.		GDP		Seco.		Ter.		GDP	
Country	Min	Mx	Min	Mx	Min	Mx	Min	Mx	Tertiary	Mx	Min	Mx	Min	Mx	Min	Mx	Min	Mx
Afghanistan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Tertiary	0.00	0.00	0.00	0.22	0.24	0.00	0.01	0.00	0.00
Albania	0.54	0.61	0.17	0.20	0.04	0.11	0.73	0.75	Tertiary	0.42	0.10	0.16	0.94	0.96	0.87	0.94	0.09	0.23
Algeria	0.28	0.63	0.17	0.22	0.07	0.17	0.53	0.55	Tertiary	0.28	0.10	0.20						
Angola	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	Tertiary	0.00	0.07	0.11	0.16	0.19	0.00	0.01	0.07	0.13
Argentina	0.80	0.94	0.89	0.94	0.29	0.40	0.79	0.91	Tertiary	0.98			1.00	1.00	1.00	1.00	0.24	0.48
Armenia	0.75	0.90	0.35	0.59	0.02	0.04	0.95	0.96	Tertiary	0.64	0.07	0.16	0.76	0.77	0.57	0.59	0.07	0.16
Australia	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	Tertiary	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Austria	0.98	1.00	0.98	1.00	1.00	1.00	1.00	1.00	Tertiary	0.92	1.00	1.00	0.99	0.99	1.00	1.00	1.00	1.00
Azerbaijan	0.63	0.64	0.32	0.32	0.00	0.05	0.99	0.99	Tertiary	0.21	0.10	0.23	0.84	0.84	0.21	0.23	0.12	0.38
Bahrain							0.91	0.91	Tertiary	0.27	1.00	1.00						
Bangladesh	0.04	0.28	0.01	0.02	0.00	0.01	0.15	0.21	Tertiary	0.02	0.01	0.01	0.38	0.39	0.07	0.09	0.01	0.03
Belarus	0.73	0.81	0.94	1.00	0.03	0.16	1.00	1.00	Tertiary	1.00	0.12	0.29	1.00	1.00	1.00	1.00	0.15	0.41
Belgium	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	Tertiary	0.90	1.00	1.00	1.00	1.00	0.96	0.98	0.98	1.00
Benin	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	Tertiary	0.03	0.01	0.01	0.26	0.28	0.10	0.13	0.00	0.00
Bhutan	0.00	0.13	0.00	0.00	0.02	0.06	0.25	0.26	Tertiary	0.00	0.04	0.10	0.69	0.72	0.02	0.05	0.04	0.14
Bolivia	0.64	0.71	0.59	0.60	0.02	0.08	0.70	0.79	Tertiary	0.51	0.03	0.08						
Botswana	0.52	0.66	0.00	0.03	0.16	0.31	0.71	0.77	Tertiary	0.13	0.18	0.28						
Brazil	0.86	1.00	0.19	0.23	0.15	0.25	0.93	0.93	Tertiary	0.40	0.24	0.29	1.00	1.00	0.62	0.63	0.25	0.34
Bulgaria	0.87	0.94	0.65	0.78	0.04	0.20	0.85	0.91	Tertiary	0.72	0.15	0.31	1.00	1.00	0.88	0.90	0.16	0.38
Burkina Faso	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Tertiary	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Burundi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Tertiary	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Cabo Verde							0.72	0.78	Tertiary	0.06	0.07	0.10	0.77	0.92	0.22	0.24	0.06	0.11
Cambodia	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.13	Tertiary	0.02	0.01	0.01						
Cameroon	0.00	0.00	0.00	0.02	0.01	0.02	0.00	0.00	Tertiary	0.02	0.02	0.02	0.30	0.32	0.11	0.14	0.01	0.03
Canada	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	Tertiary	0.93	1.00	1.00	1.00	1.00	0.86	0.86	1.00	1.00
Central African Republic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Tertiary	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chad	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Tertiary	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02
Chile	0.74	0.78	0.60	0.64	0.22	0.36	0.88	0.93	Tertiary	0.77	0.29	0.41	0.99	1.00	1.00	1.00	0.32	0.52
China	0.41	0.47	0.05	0.13	0.03	0.08	0.57	0.65	Tertiary	0.23	0.05	0.11	0.92	0.92	0.49	0.51	0.14	0.28
Colombia	0.46	0.62	0.33	0.39	0.06	0.17	0.84	0.87	Tertiary	0.44	0.13	0.22	0.92	0.98	0.65	0.68	0.16	0.28
Comoros	0.00	0.04	0.00	0.00	0.00	0.01							0.34	0.36	0.00	0.02	0.00	0.00
Congo, Dem. Rep.													0.08	0.11	0.00	0.00	0.00	0.00
Congo, Rep.	0.00	0.13	0.00	0.02	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.19	0.22	0.00	0.03	0.04	0.11
Costa Rica	0.30	0.45	0.20	0.23	0.16	0.29							1.00	1.00	0.66	0.68	0.20	0.32

	2000						2007						2014					
	Seco.		Ter.		GDP		Seco.		Ter.		GDP		Seco.		Ter.		GDP	
Cote d'Ivoire	0.00	0.00	0.01	0.06	0.01	0.02							0.00	0.00	0.00	0.01	0.01	0.03
Croatia	0.78	0.82	0.51	0.53	0.22	0.31	0.95	0.99	0.66	0.68	0.37	0.52	0.98	0.98	0.88	0.90	0.29	0.48
Cuba	0.69	0.80	0.34	0.35	0.08	0.34							0.95	0.98	0.47	0.49	0.14	0.15
Cyprus	0.88	0.95	0.29	0.31	0.60	0.76	0.97	1.00	0.48	0.49	0.82	0.86	0.99	0.99	0.66	0.68	0.59	0.71
Czech Republic	0.82	0.90	0.46	0.48	0.39	0.65	0.92	0.94	0.77	0.78	0.49	0.69	1.00	1.00	0.85	0.87	0.43	0.73
Denmark	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Djibouti	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.01	0.03						
Dominican Republic	0.28	0.45	0.48	0.48	0.11	0.17							0.63	0.67	0.58	0.61	0.13	0.29
Ecuador	0.24	0.44	0.46	0.46	0.05	0.15	0.48	0.50	0.52	0.53	0.09	0.18	1.00	1.00	0.51	0.57	0.12	0.23
Egypt, Arab Rep.	0.74	0.82	0.52	0.62	0.04	0.11	0.49	0.61	0.37	0.42	0.04	0.18	0.69	0.72	0.33	0.35	0.05	0.21
El Salvador	0.18	0.39	0.21	0.33	0.08	0.13	0.41	0.50	0.26	0.29	0.09	0.12	0.61	0.62	0.29	0.31	0.07	0.15
Equatorial Guinea	0.00	0.02	0.00	0.00	0.10	0.31												
Eritrea	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00
Estonia	0.88	1.00	0.99	1.00	0.18	0.36	1.00	1.00	0.99	1.00	0.43	0.58	1.00	1.00	0.97	0.98	0.41	0.64
Ethiopia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Fiji	0.64	0.72	0.21	0.21	0.09	0.11	0.83	0.86	0.15	0.16	0.08	0.20						
Finland	1.00	1.00	1.00	1.00	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	1.00
France	1.00	1.00	0.91	1.00	0.96	1.00	1.00	1.00	0.75	0.76	1.00	1.00	1.00	1.00	0.79	0.85	0.91	1.00
Gabon	0.11	0.34	0.01	0.08	0.14	0.43												
Gambia, The	0.00	0.10	0.00	0.00	0.00	0.01												
Georgia	0.52	0.72	0.54	0.65	0.01	0.05	0.82	1.00	0.49	0.57	0.05	0.12	0.96	0.98	0.48	0.51	0.08	0.17
Germany	0.97	0.98	0.77	0.86	0.96	1.00							1.00	1.00	0.83	0.86	1.00	1.00
Ghana	0.00	0.20	0.00	0.00	0.00	0.01	0.17	0.27	0.00	0.00	0.01	0.03	0.27	0.41	0.09	0.13	0.01	0.05
Greece	0.84	0.92	0.90	1.00	0.59	0.77	0.93	1.00	1.00	1.00	0.78	0.81	0.99	1.00	1.00	1.00	0.48	0.60
Guatemala	0.00	0.16	0.09	0.10	0.04	0.10	0.16	0.30	0.17	0.19	0.06	0.12	0.22	0.38	0.13	0.15	0.06	0.13
Guinea	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.00	0.00	0.00	0.01	0.03	0.05	0.00	0.00
Guinea-Bissau	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Guyana	0.71	0.99	0.13	0.13	0.03	0.08	0.72	0.92	0.08	0.09	0.02	0.18	0.96	0.98	0.04	0.06	0.07	0.13
Haiti	0.02	0.02	0.00	0.00	0.00	0.01												
Honduras	0.28	0.28	0.17	0.21	0.02	0.06	0.39	0.44	0.18	0.20	0.04	0.06	0.19	0.41	0.16	0.18	0.03	0.07
Hong Kong, China	0.67	0.72	0.44	0.44	0.98	1.00	0.75	0.77	0.57	0.58	1.00	1.00	1.00	1.00	0.90	0.92	0.90	1.00
Hungary	0.95	0.99	0.61	0.65	0.31	0.54	0.94	0.98	0.99	1.00	0.37	0.50	1.00	1.00	0.65	0.66	0.30	0.57
India	0.08	0.26	0.09	0.12	0.01	0.03	0.35	0.36	0.10	0.12	0.01	0.04	0.56	0.58	0.25	0.27	0.02	0.09
Indonesia	0.23	0.44	0.16	0.21	0.01	0.05	0.54	0.58	0.18	0.20	0.03	0.15	0.72	0.73	0.31	0.33	0.06	0.21
Iran, Islamic Rep.	0.64	0.72	0.27	0.29	0.06	0.22	0.65	0.68	0.38	0.40	0.14	0.26	0.76	0.80	0.85	0.89	0.10	0.38

	2000						2007						2014					
	Seco.		Ter.		GDP		Seco.		Ter.		GDP		Seco.		Ter.		GDP	
Iraq							0.26	0.30	0.15	0.16	0.08	0.13						
Ireland	1.00	1.00	0.79	0.88	1.00	1.00	1.00	1.00	0.84	0.88	1.00	1.00	1.00	1.00	0.98	0.88	0.99	1.00
Israel	0.88	1.00	0.87	0.90	0.69	0.80	1.00	1.00	0.88	0.89	0.72	0.73	1.00	1.00	0.86	0.84	0.74	0.90
Italy	0.89	0.93	0.84	0.86	0.92	1.00	0.99	1.00	0.97	0.98	0.98	1.00	1.00	1.00	0.80	0.29	0.79	0.85
Jamaica	0.70	0.87	0.19	0.22	0.10	0.16	0.88	0.96	0.23	0.31	0.13	0.18	0.69	0.70	0.27	0.83	0.09	0.16
Japan	1.00	1.00	0.80	0.86	1.00	1.00	0.98	1.00	0.82	0.84	1.00	1.00	1.00	1.00	0.81	0.45	0.82	1.00
Jordan	0.76	0.86	0.46	0.48	0.04	0.09	0.78	0.93	0.51	0.57	0.08	0.22	0.49	0.50	0.42	0.61	0.07	0.24
Kazakhstan	0.80	0.97	0.45	0.55	0.03	0.15	0.98	1.00	0.83	0.87	0.19	0.40						
Kenya	0.00	0.13	0.00	0.00	0.00	0.01	0.25	0.26	0.00	0.00	0.01	0.02						
Korea, Rep.							0.93	0.98	1.00	1.00	0.68	0.74	1.00	1.00	1.00	0.58	0.60	0.80
Kyrgyz Republic	0.74	0.80	0.58	0.67	0.00	0.01	0.79	0.83	0.59	0.59	0.01	0.03	0.85	0.87	0.56	0.16	0.01	0.03
Lao PDR	0.00	0.06	0.00	0.00	0.00	0.01	0.08	0.14	0.07	0.09	0.01	0.04	0.31	0.33	0.14	0.94	0.02	0.09
Latvia	0.85	0.90	1.00	1.00	0.16	0.31	1.00	1.00	1.00	1.00	0.41	0.56	1.00	1.00	0.88	0.53	0.33	0.52
Lebanon	0.56	0.93	0.56	0.70	0.13	0.25	0.64	0.65	0.66	0.66	0.18	0.31	0.35	0.37	0.51	0.04	0.17	0.38
Lesotho	0.00	0.05	0.00	0.00	0.01	0.02	0.08	0.13	0.00	0.00	0.02	0.02	0.19	0.35	0.02	0.06	0.01	0.03
Liberia	0.00	0.13	0.04	0.29	0.00	0.00							0.00	0.00	0.04	0.94	0.00	0.00
Libya	0.87	1.00	0.80	0.89	0.08	0.37												
Lithuania	0.97	1.00	0.88	1.00	0.27	0.28	1.00	1.00	1.00	1.00	0.31	0.51	1.00	1.00	0.91	0.18	0.36	0.63
Luxembourg							0.95	0.99	0.06	0.07	1.00	1.00	1.00	1.00	0.16	0.46	1.00	1.00
Macedonia, FYR	0.72	0.78	0.34	0.36	0.07	0.20	0.71	0.72	0.45	0.46	0.08	0.21	0.67	0.68	0.44	0.00	0.11	0.27
Madagascar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Malawi	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.46	0.00	0.00
Malaysia	0.45	0.58	0.39	0.42	0.11	0.32	0.48	0.66	0.38	0.39	0.16	0.40						
Mali	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.08	0.00	0.00	0.00	0.00
Mauritania	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.03	0.06	0.00	0.00	0.00	0.47	0.01	0.06
Mauritius	0.58	0.69	0.05	0.14	0.16	0.31	0.82	0.90	0.29	0.30	0.18	0.31	1.00	1.00	0.45	0.34	0.21	0.42
Mexico	0.53	0.62	0.28	0.29	0.25	0.34	0.74	0.77	0.29	0.30	0.26	0.37	0.86	0.96	0.32	0.66	0.22	0.38
Moldova	0.49	0.76	0.42	0.55	0.00	0.01	0.83	0.85	0.56	0.57	0.04	0.07	0.79	1.00	0.49	0.85	0.03	0.09
Mongolia	0.44	0.52	0.47	0.52	0.00	0.03	0.85	0.88	0.66	0.66	0.02	0.14	0.86	0.86	0.80	0.76	0.07	0.24
Montenegro							0.94	0.96	0.43	0.46	0.17	0.34	0.88	0.88	0.72	0.26	0.15	0.33
Morocco	0.00	0.12	0.08	0.10	0.03	0.06	0.30	0.33	0.08	0.09	0.05	0.08	0.49	0.50	0.24	0.00	0.05	0.14
Mozambique	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00
Namibia	0.30	0.44	0.02	0.06	0.09	0.17	0.46	0.48	0.01	0.05	0.12	0.17						
Myanmar							0.15	0.20	0.06	0.07	0.00	0.02	0.20	0.21	0.07	0.16	0.01	0.07
Nepal	0.00	0.11	0.00	0.00	0.00	0.00	0.16	0.17	0.05	0.07	0.00	0.00	0.44	0.46	0.10	1.00	0.00	0.01
Netherlands	1.00	1.00	0.92	0.94	1.00	1.00	1.00	1.00	0.87	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
New Zealand	0.96	1.00	1.00	1.00	0.62	0.83	1.00	1.00	1.00	1.00	0.83	0.85	1.00	1.00	1.00	0.15	0.79	1.00
Nicaragua	0.18	0.35	0.24	0.27	0.02	0.04												

	2000						2007						2014					
	Seco.		Ter.		GDP		Seco.		Ter.		GDP		Seco.		Ter.		GDP	
Niger	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
Nigeria	0.00	0.00	0.03	0.04	0.00	0.01	0.00	0.00	0.06	0.07	0.03	0.06						
Norway	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.42	1.00	1.00
Oman	0.58	0.73	0.03	0.18	0.33	0.54	0.82	0.86	0.22	0.24	0.45	0.72						
Pakistan	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.01	0.00	0.00	0.01	0.04	0.00	0.03	0.01	0.55	0.01	0.08
Panama	0.41	0.52	0.53	0.76	0.14	0.25	0.50	0.51	0.59	0.60	0.18	0.33	0.58	0.59	0.53	0.00	0.23	0.46
Papua New Guinea	0.00	0.00	0.00	0.00	0.02	0.03												
Paraguay	0.29	0.50	0.19	0.23	0.05	0.11	0.47	0.49	0.36	0.37	0.07	0.14	0.60	0.61	0.00	0.91	0.07	0.17
Peru	0.67	0.81	0.52	0.58	0.08	0.16	0.81	0.87	0.45	0.46	0.09	0.16	0.93	0.95	0.67	0.42	0.12	0.25
Philippines	0.59	0.68	0.47	0.51	0.02	0.08	0.71	0.74	0.35	0.36	0.04	0.09	0.79	0.81	0.40	0.91	0.05	0.16
Poland	1.00	1.00	0.87	0.95	0.21	0.37	0.97	1.00	0.98	0.99	0.30	0.41	1.00	1.00	0.89	0.86	0.31	0.57
Portugal	1.00	1.00	0.84	0.85	0.55	0.70	1.00	1.00	0.83	0.83	0.64	0.68	1.00	1.00	0.84	0.60	0.49	0.64
Romania	0.68	0.77	0.37	0.41	0.07	0.20	0.80	0.82	0.78	0.84	0.21	0.35	0.88	0.91	0.58	1.00	0.21	0.45
Russian Federation	0.70	0.95	0.98	1.00	0.09	0.26	0.74	0.76	1.00	1.00	0.25	0.45						
Rwanda	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.75	0.00	0.00
Saudi Arabia	0.44	0.44	0.31	0.36	0.37	0.64					0.01	0.03						
Senegal	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.02	0.02	0.15	0.18	0.02	0.76	0.01	0.01
Serbia	0.66	0.90	0.58	0.65	0.09	0.22	0.84	0.87	0.67	0.68	0.14	0.26	0.90	0.91	0.74	1.00	0.12	0.29
Sierra Leone	0.00	0.00	0.00	0.00	0.00	0.00												
Singapore													1.00	1.00	1.00	0.68	1.00	1.00
Slovak Republic	0.77	0.83	0.46	0.47	0.33	0.46	0.88	0.92	0.71	0.71	0.45	0.52	0.84	0.85	0.66	1.00	0.41	0.65
Slovenia	1.00	1.00	0.98	1.00	0.57	0.72	0.98	1.00	1.00	1.00	0.66	0.75	1.00	1.00	1.00	0.18	0.54	0.69
South Africa	0.64	0.80	0.16	0.20	0.16	0.30							1.00	1.00	0.16	0.00	0.13	0.27
Spain	0.91	1.00	0.98	1.00	0.71	0.90	1.00	1.00	1.00	1.00	0.85	0.91	1.00	1.00	1.00	0.17	0.68	0.76
Sri Lanka	0.66	0.79	0.10	0.10	0.02	0.06							0.99	0.99	0.15	0.14	0.06	0.22
Sudan	0.00	0.05	0.01	0.05	0.00	0.01	0.00	0.03	0.11	0.12	0.01	0.02	0.07	0.10	0.12	0.00	0.03	0.06
South Sudan													0.00	0.00	0.00	1.00	0.00	0.01
Suriname	0.58	0.76	0.12	0.15	0.08	0.14												
Swaziland	0.02	0.17	0.00	0.01	0.06	0.13	0.28	0.41	0.00	0.00	0.08	0.12	0.40	0.57	0.00	0.82	0.06	0.18
Sweden	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.80	0.74	1.00	1.00
Switzerland	0.91	0.99	0.62	0.69	1.00	1.00	0.93	0.97	0.66	0.66	1.00	1.00	1.00	1.00	0.72	0.54	1.00	1.00
Syrian Arab Republic	0.00	0.20	0.00	0.16	0.01	0.06	0.57	0.58	0.25	0.27	0.04	0.05						
Tajikistan	0.61	0.64	0.15	0.27	0.00	0.00	0.73	0.75	0.26	0.27	0.00	0.00	0.79	0.81	0.23	0.00	0.00	0.03
Tanzania	0.00	0.00	0.00	0.00	0.00	0.00							0.00	0.00	0.00	0.64	0.00	0.02
Thailand	0.45	0.69	0.57	0.60	0.06	0.18	0.67	0.69	0.68	0.69	0.08	0.27	1.00	1.00	0.62	0.04	0.12	0.33
Timor-Leste							0.18	0.26	0.16	0.18	0.00	0.04						

	2000						2007						2014					
	Seco.		Ter.		GDP		Seco.		Ter.		GDP		Seco.		Ter.		GDP	
Togo	0.00	0.03	0.00	0.00	0.00	0.00	0.11	0.17	0.00	0.00	0.00	0.00	0.23	0.23	0.02	0.41	0.00	0.00
Trinidad and Tobago	0.62	0.68	0.00	0.04	0.23	0.39												
Tunisia	0.50	0.66	0.27	0.29	0.09	0.17	0.86	0.88	0.42	0.43	0.10	0.17	0.79	0.80	0.39	1.00	0.08	0.23
Turkey	0.52	0.67	0.34	0.41	0.17	0.30	0.85	0.88	0.52	0.53	0.25	0.38						
Turkmenistan													0.76	0.76	0.00	0.00	0.15	0.32
Uganda	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
Ukraine	0.93	1.00	0.86	0.91	0.02	0.10	0.95	0.96	1.00	1.00	0.07	0.19	0.93	0.95	1.00	0.74	0.05	0.16
United Kingdom	0.99	1.00	1.00	1.00	0.94	1.00	0.96	1.00	0.84	0.85	1.00	1.00	1.00	1.00	0.73	1.00	0.90	1.00
United States	0.89	0.92	1.00	1.00	1.00	1.00	0.93	0.96	1.00	1.00	1.00	1.00	0.93	0.95	1.00	0.79	1.00	1.00
Uruguay	0.86	1.00	0.58	0.62	0.18	0.31	0.88	0.91	0.72	0.93	0.23	0.33	1.00	1.00	0.78	0.01	0.32	0.46
Uzbekistan	0.82	0.98	0.06	0.16	0.01	0.02	0.84	1.00	0.05	0.06	0.01	0.04	0.86	0.87	0.00	0.34	0.03	0.10
Venezuela, RB	0.39	0.44	0.32	0.46	0.10	0.29	0.67	0.70	1.00	1.00	0.35	0.46						
Vietnam	0.40	0.47	0.07	0.10	0.00	0.02												
Yemen, Rep.	0.04	0.23	0.09	0.14	0.00	0.03	0.10	0.13	0.06	0.07	0.01	0.09						
Zambia	0.00	0.00	0.00	0.00	0.00	0.01												
Zimbabwe	0.00	0.20	0.00	0.00	0.01	0.03							0.10	0.22	0.00	0.01	0.00	0.01

B. Description of Estimators of GDP, Secondary and tertiary education[22]

	Estimators for GDP for the year 2000
GDP1	Per Capita GDP (1990 International Geary-Khamis dollars)
GDP2	GDP per Capita (current US$)
GDP3	GDP per capita (constant 1995 US$)
GDP4	GNI per capita, Atlas method (current US$), 2004 file
GDP5	GDP per capita, PPP (constant 1995 international $)
GDP6	GDP per capita, PPP (current international $) 2004 file
GDP7	GNI per capita, PPP (current international $) 2004 file
GDP8	GDP per capita (constant 2000 US$) 2009 file
GDP9	GDP per capita, PPP (current international $) 2009 file
GDP10	GDP per capita, PPP (constant 2005 international $) 2009 file
GDP11	GNI per capita, Atlas method (current US$) 2009 file
GDP12	GNI per capita, PPP (current international $) 2009 file
GDP13	GDP per capita (current US$) 2015 file
GDP14	GDP per capita (constant 2005 US$) 2015 file
GDP15	GDP per capita, PPP (constant 2011 international $) 2015 file
GDP16	GDP per capita, PPP (current international $) 2015 file
GDP17	GNI per capita, Atlas method (current US$) 2015 file
GDP18	GNI per capita (constant 2005 US$) 2015 file

	Estimators for GDP for the year 2014
GDP1	GDP per capita (current US$) 2018 file
GDP2	GDP per capita (constant 2010 US$) 2018 file
GDP3	GDP per capita, PPP (current international $) 2018 file
GDP4	GDP per capita, PPP (constant 2011 international $) 2018 file
GDP5	GNI per capita, Atlas method (current US$) 2018 file
GDP6	GNI per capita (constant 2010 US$) 2018 file
GDP7	GNI per capita, PPP (current international $) 2018 file
GDP8	GNI per capita, PPP (constant 2011 international $) 2018 file
GDP9	2014 GDP published by IMF in October 2015 IMF-2015
GDP10	2014 GDP published by IMF in October 2015

	Estimators for Tertiary Education for the year 2000
Ter1	School enrollment, tertiary (% gross) file 2004
Ter2	School enrollment, tertiary (% gross) file 2009
Ter3	School enrollment, tertiary (% gross) file 2015
Ter4	School Enrollment file lee lee

	Estimators for Tertiary Education for the year 2007
Ter1	School enrollment, tertiary (% gross) file 2015

[22] *International Dollar Geary-Khamis Defined, Examples Explained. Business Case Website,* [https://www.business-case-analysis.com/international-dollar.html]

	Estimators for GDP for the year 2000
GDP19	GNI per capita, PPP (constant 2011 international $) 2015 file
GDP20	GNI per capita, PPP (current international $) 2015 file
	Estimators for GDP for the year 2007
GDP1	GDP per capita (current US$) 2015 file
GDP2	GDP per capita (constant 2005 US$) 2015 file
GDP3	GDP per capita, PPP (constant 2011 international $) 2015 file
GDP4	GDP per capita, PPP (current international $) 2015 file
GDP5	GNI per capita, Atlas method (current US$) 2015 file
GDP6	GNI per capita (constant 2005 US$) 2015 file
GDP7	GNI per capita, PPP (current international $) 2015 file
GDP8	GNI per capita, PPP (constant 2011 international $) 2015 file
GDP9	GDP per capita (current US$) 2015 file
GDP10	GDP per capita (constant 2010 US$) 2015 file
GDP11	GDP per capita, PPP (current international $) 2015 file
GDP12	GDP per capita, PPP (constant 2017 international $) 2015 file
GDP13	GNI per capita, Atlas method (current US$) 2015 file
GDP14	GNI per capita (constant 2010 US$) 2015 file
GDP15	GNI per capita, PPP (current international $) 2015 file
GDP16	GNI per capita, PPP (constant 2017 international $) 2015 file

	Estimators for GDP for the year 2014
Ter2	School enrollment, tertiary (% gross) file 2019
Ter3	School enrollment, tertiary (% gross) file 2021
	Estimators for Tertiary Education for the year 2014
Ter1	School enrollment, tertiary (% gross) file 2018
Ter2	School enrollment, tertiary (% gross) file 2019
Ter3	School enrollment, tertiary (% gross) file 2023

	Estimators for Secondary Education for the year 2000
Sec1	School enrollment, secondary (% gross) file 2004
Sec2	School enrollment, secondary (% gross) file 2009
Sec3	School enrollment, secondary (% gross) file 2015
Sec4	School Enrollment file lee lee
	Estimators for Secondary Education for the year 2007
Sec1	School enrollment, secondary (% gross) file 2015
Sec2	School enrollment, secondary (% gross) file 2019
Sec3	School enrollment, secondary (% gross) file 2021
	Estimators for Secondary Education for the year 2014
Sec1	School enrollment, secondary (% gross) file 2018
Sec2	School enrollment, secondary (% gross) file 2019
Sec3	School enrollment, secondary (% gross) file 2023