



GEORGIAN FOUNDATION FOR  
STRATEGIC AND INTERNATIONAL STUDIES

## THE LEADING G20 COUNTRIES IN ECONOMIC GROWTH IN THE POST-CRISIS PERIOD

VLADIMIR PAPAUA

63

EXPERT OPINION





საქართველოს სტრატეგიისა და საერთაშორისო ურთიერთობათა კვლევის ფონდი  
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## **EXPERT OPINION**

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One of the main problems of economic development is to ensure stable economic growth. It should be emphasized that this problem has been analyzed in a number of significant publications.<sup>1</sup> Interesting results were published in econometric studies addressing the issue.<sup>2</sup>

In order to measure economic growth, it is particularly important to use a more or less adequate method allowing an inter-country comparison of countries and regions. Such a comparison, however, is complicated by the existence of the so-called “catch-up effect.” A special method has been devised for working to solve this problem.<sup>3</sup> The usage of this method gives very different results about the leading world countries vis-à-vis their economic growth, with and without the elimination of the catch-up effect. In this paper, the method for resolving the problem is shown in the example of the leading G20 countries in post-crisis economic growth. The list of G20 countries includes not only countries but the EU as well. Because the paper is focused on the problem of the leading G20 countries in economic growth, we will examine only 19 countries from the G20.

Economic growth is measured using the gross domestic product<sup>4</sup> (GDP) growth rate indicator. The amount of increase in the real GDP is divided by the amount of the base-period real GDP in order to create the indicator.

One of the problems in measuring economic growth is found in making a comparison of the indicators for countries and regions. The essence of the problem is that due to diminishing returns on capital, with all other things being equal, it is easier to achieve higher rates of economic growth in countries with relatively low levels of economic development than in those with a more advanced economy. In economics, this phenomenon is known as the *catch-up effect*.<sup>5</sup>

To illustrate this effect, let us consider the indicators of economic growth in the G20 countries in the post-crisis period from 2010 up to 2013 (Table 1).

Table 1.

**Indicators of Economic Growth in the G20 Countries in 2010-2013<sup>6</sup>**

No.	Countries	Year			
		2010	2011	2012	2013
1	Argentina	9,1	8,6	0,9	2,9
2	Australia	2,0	2,3	3,7	2,5
3	Brazil	7,5	2,7	1,0	2,5
4	Canada	3,4	2,5	1,7	2,0
5	China	10,4	9,3	7,7	7,7
6	France	2,0	2,1	0,3	0,3
7	Germany	4,1	3,6	0,4	0,1
8	India	10,3	6,6	4,7	5,0
9	Indonesia	6,2	6,5	6,3	5,8
10	Italy	1,7	0,6	-2,3	-1,9
11	Japan	4,7	-0,5	1,8	1,6
12	Mexico	5,1	4,0	4,0	1,1
13	Russia	4,5	4,3	3,4	1,3
14	Saudi Arabia	7,4	8,6	5,8	4,0
15	South Africa	3,1	3,6	2,5	1,9
16	South Korea	6,5	3,7	2,3	3,0
17	Turkey	9,2	8,8	2,1	4,1
18	United Kingdom	1,9	1,6	0,7	1,7
19	United States	2,5	1,6	2,3	2,2

According to the economic growth data for all of the countries listed in Table 1, the leading countries in economic growth during the post-crisis period are China, Indonesia and India. At the same time, negative economic growth occurred in Italy and Japan with the lowest growth rates observed in France, the U.K. and the U.S.

Naturally, a direct comparison of economic growth indicators does not give a true estimate of the real situation because the “starting conditions” (i.e., the level of economic development) differ significantly from country to country.

A comparison of countries with different economic development levels is only possible by removing the catch-up effect from the economic growth rates. For this, it is necessary to find a coefficient that would enable us to make an appropriate adjustment of the economic growth rates for these particular countries and regions.

The aggregate indicator of a country’s economic development is the GDP per capita whose amount is determined by dividing the GDP by the population. It should be noted that in comparing countries and regions, the GDP is usually measured in US dollars.

The figures for the GDP per capita are given in Table 2.

Table 2.

**Indicators of Economic Development Level (GDP per capita) in the G20 Countries in 2010-2013<sup>7</sup>**

No.	Countries	Year			
		2010	2011	2012	2013
1	Argentina	11 460,4	13 693,7	14 679,9	14 715,2
2	Australia	51 800,9	62 133,7	67 524,8	67 458,4
3	Brazil	10 978,3	12 576,2	11 320,0	11 208,1
4	Canada	47 465,3	51 790,6	52 409,2	51 958,4
5	China	4 433,3	5 447,3	6 092,8	6 807,4
6	France	40 706,1	43 809,7	40 908,3	42 503,3
7	Germany	41 723,4	45 870,6	43 931,7	46 268,6
8	India	1 417,1	1 539,6	1 503,0	1 498,9
9	Indonesia	2 946,7	3 469,8	3 551,4	3 475,3
10	Italy	35 875,7	38 367,3	35 132,2	35 925,9
11	Japan	43 117,8	46 203,7	46 679,3	38 633,7
12	Mexico	8 920,7	9 802,9	9 817,8	10 307,3

13	Russia	10 709,8	13 324,3	14 090,6	14 611,7
14	Saudi Arabia	19 326,6	24 116,2	25 946,0	25 961,8
15	South Africa	7 175,6	7 830,5	7 314,0	6 617,9
16	South Korea	22 151,2	24 155,8	24 454,0	25 977,0
17	Turkey	10 135,7	10 604,6	10 660,7	10 971,7
18	United Kingdom	38 363,4	40 972,0	41 053,7	41 787,5
19	United States	48 377,4	49 803,5	51 495,9	53 042,0

For example, according to Table 2, the U.S. economy in 2013 was 7.8 times the size of the economy of China (in terms of the GDP per capita), 15.6 times the size of the economy of Indonesia and 35.4 times the size of the economy of India. Due to the catch-up effect, with all other things being equal, it is much more difficult for the U.S. to achieve an economic growth of 1% than it is for each of these other countries.

It is logical to assume that since the U.S. economy in 2013, for example, was 7.8 times larger in GDP per capita terms than the economy of China, it would be 7.8 times more difficult for the U.S., with all else being equal, to achieve the same economic growth as in China. This can be explained by the following hypothesis: if the level of economic development of one country is  $n$  times higher than the level of economic development of another country, achieving the same economic growth in the former will be  $n$  times more difficult than in the latter.

Let us call this assumption the hypothesis of proportional overlap of the catch-up effect or, in short, the proportional overlap hypothesis. Likewise, the appropriate coefficient will be the coefficient of the proportional overlap.

For the calculation of the coefficients of the proportional overlap, the “etalon” country for these calculations first needs to be chosen. Given that Australia has the highest level of economic development (in terms of the GDP per capita) among the G20 countries, it is logical, therefore, to use its indicator for making the basic calculations (see Table 3).

Table 3.

**Coefficients of Proportional Overlap of the Catch-Up Effect  
(Ratio of GDP per capita in Australia to Similar Indicators of Other G20 Countries)**

No.	Countries	Year			
		2010	2011	2012	2013
1	Argentina	4,519991	4,537393	4,599813	4,584267
2	Australia	1	1	1	1
3	Brazil	4,718481	4,940578	5,965088	6,018719
4	Canada	1,091343	1,19971	1,288415	1,298316
5	China	11,6845	11,40633	11,08272	9,909569
6	France	1,272559	1,418264	1,650638	1,587133
7	Germany	1,241531	1,354543	1,53704	1,457974
8	India	36,55416	40,35704	44,92668	45,00527
9	Indonesia	17,57929	17,907	19,01357	19,41081
10	Italy	1,443899	1,619444	1,92202	1,877709
11	Japan	1,201381	1,344778	1,446568	1,746102
12	Mexico	5,80682	6,338298	6,877793	6,544721
13	Russia	4,836776	4,663187	4,792188	4,616739
14	Saudi Arabia	2,68029	2,57643	2,602513	2,598371
15	South Africa	7,219034	7,934832	9,232267	10,19332
16	South Korea	2,338514	2,572206	2,761299	2,596851
17	Turkey	5,110737	5,859127	6,333993	6,1484
18	United Kingdom	1,350269	1,516492	1,644792	1,61432
19	United States	1,070767	1,247577	1,311266	1,271792

The adjusted economic growth in any country corresponding to that in the “etalon” country, given the hypothesis of proportional overlap of the catch-up effect, will be the ratio of the actual economic growth indicators and coefficients of proportional overlap of the catch-up effect. Table 4 reflects the indicator of adjusted economic growth.



Table 4.

**Adjusted Economic Growth Rates (2010-2013)**

No.	Countries	Year			
		2010	2011	2012	2013
1	Argentina	2,013279	1,895361	0,19566	0,632598
2	Australia	2	2,3	3,7	2,5
3	Brazil	1,589495	0,546495	0,167642	0,415371
4	Canada	3,115429	2,083837	1,319451	1,540458
5	China	0,890068	0,815337	0,694775	0,777027
6	France	1,571637	1,480684	0,181748	0,18902
7	Germany	3,302374	2,657723	0,26024	0,068588
8	India	0,281774	0,16354	0,104615	0,111098
9	Indonesia	0,352688	0,362987	0,331342	0,298803
10	Italy	1,177367	0,370497	-1,19666	-1,01187
11	Japan	3,912165	-0,37181	1,244324	0,916327
12	Mexico	0,878278	0,631084	0,581582	0,168074
13	Russia	0,930372	0,922116	0,709488	0,281584
14	Saudi Arabia	2,760895	3,337952	2,228615	1,539426
15	South Africa	0,42942	0,453696	0,270789	0,186397
16	South Korea	2,779542	1,438454	0,832941	1,155245
17	Turkey	1,800132	1,50193	0,331544	0,66684
18	United Kingdom	1,407127	1,055067	0,425586	1,053075
19	United States	2,334776	1,282486	1,754031	1,729842

Table 5 reflects both indicators – the actual and the adjusted data of economic growth rates.

Table 5.

**Actual and Adjusted Economic Growths Rates (2010-2013)**

No.	Countries	Year				
			2010	2011	2012	2013
1	Argentina	actual data	9,1	8,6	0,9	2,9
		adjusted data	2,0	1,9	0,2	0,6
2	Australia	actual data	2,0	2,3	3,7	2,5
		adjusted data	2,0	2,3	3,7	2,5
3	Brazil	actual data	7,5	2,7	1,0	2,5
		adjusted data	1,6	0,5	0,2	0,4
4	Canada	actual data	3,4	2,5	1,0	2,5
		adjusted data	3,1	2,1	1,3	1,5
5	China	actual data	10,4	9,3	7,7	7,7
		adjusted data	0,9	0,8	0,7	0,8
6	France	actual data	2,0	2,1	0,3	0,3
		adjusted data	1,6	1,5	0,2	0,2
7	Germany	actual data	4,1	3,6	0,4	0,1
		adjusted data	3,3	2,7	0,3	0,1
8	India	actual data	10,3	6,6	4,7	5,0
		adjusted data	0,3	0,2	0,1	0,1
9	Indonesia	actual data	6,2	6,5	6,3	5,8
		adjusted data	0,4	0,4	0,3	0,3
10	Italy	actual data	1,7	0,6	-2,3	-1,9
		adjusted data	1,2	0,4	-1,2	-1,0
11	Japan	actual data	4,7	-0,5	1,8	1,6
		adjusted data	3,9	-0,4	1,2	0,9
12	Mexico	actual data	5,1	4,0	4,0	1,1
		adjusted data	0,9	0,6	0,6	0,2
13	Russia	actual data	4,5	4,3	3,4	1,3
		adjusted data	0,9	0,9	0,7	0,3

14	Saudi Arabia	actual data	7,4	8,6	5,8	4,0
		adjusted data	2,8	3,3	2,2	1,5
15	South Africa	actual data	3,1	3,6	2,5	1,9
		adjusted data	0,4	0,5	0,3	0,2
16	South Korea	actual data	6,5	3,7	2,3	3,0
		adjusted data	2,8	1,4	0,8	1,2
17	Turkey	actual data	9,2	8,8	2,1	4,1
		adjusted data	1,8	1,5	0,3	0,7
18	United Kingdom	actual data	1,9	1,6	0,7	1,7
		adjusted data	1,4	1,1	0,4	1,1
19	United States	actual data	2,5	1,6	2,3	2,2
		adjusted data	2,3	1,3	1,8	1,7

As is evident from Table 5, the actual economic growth in China, for example, in 2013 was 7.7% and only 2.5% in Australia even though the Australian economy was 9.9 times larger than the Chinese economy in GDP per capita terms. Consequently, the 7.7% growth of the Chinese economy corresponds to the Australian economic growth of 0.8% (7.7:9.9). Similarly adjusted indicators of economic growth in other G20 countries are also given in Tables 4 and 5.

According to Table 6, the leading G20 countries in economic growth are Australia, the U.S., Canada and Saudi Arabia and not China, Indonesia and India.

Table 6.

**Rankings of G20 Countries by Actual and Adjusted Economic Growths Rates  
(2010-2013)**

No.	Countries	Year				
			2010	2011	2012	2013
1	Argentina	actual data	4	3-4	15	7
		adjusted data	7-8	5	15-17	10
2	Australia	actual data	16-17	14	6	8-9
		adjusted data	7-8	3	1	1
3	Brazil	actual data	5	12	14	8-9
		adjusted data	10-11	14-15	15-17	11
4	Canada	actual data	13	13	13	11
		adjusted data	3	4	4	3-4
5	China	actual data	1	1	1	1
		adjusted data	14-16	12	7-8	8
6	France	actual data	16-17	15	18	17
		adjusted data	10-11	6-7	15-17	14-16
7	Germany	actual data	11	10-11	17	18
		adjusted data	2	2	11-14	17-18
8	India	actual data	2	5	4	3
		adjusted data	19	17	18	17-18
9	Indonesia	actual data	8	6	2	2
		adjusted data	17-18	15-16	11-14	12-13
10	Italy	actual data	19	18	19	19
		adjusted data	13	15-16	19	19
11	Japan	actual data	10	19	12	14
		adjusted data	1	19	5	7
12	Mexico	actual data	9	8	5	16
		adjusted data	14-16	13	9	14-16

13	Russia	actual data	12	7	7	15
		adjusted data	14-16	11	7-8	12-13
14	Saudi Arabia	actual data	6	3-4	3	5
		adjusted data	4-5	1	2	3-4
15	South Africa	actual data	14	10-11	8	12
		adjusted data	17-18	14-15	11-14	14-16
16	South Korea	actual data	7	9	9-10	6
		adjusted data	4-5	8	6	5
17	Turkey	actual data	3	2	11	4
		adjusted data	9	6-7	11-14	9
18	United Kingdom	actual data	18	10-11	16	13
		adjusted data	12	10	10	6
19	United States	actual data	15	16-17	9-10	10
		adjusted data	6	9	3	2

According to the invariance principle,<sup>8</sup> the ratio between economic growth rates adjusted for the catch-up effect does not depend on the choice of the “etalon” country.

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