

**CO-MOVEMENTS OF THE WOLD'S STOCK MARKETS BEFORE AND AFTER
THE 2008 STOCK MARKET CRASH: GLOBAL PROTFOLIO
DIVERSIFICATION IMPLICATIONS**

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Abstract

The 1987 and 2008 crashes are the two most important global stock market crashes since the Great Depression. Although there are many studies that examine the effects of the 1987 crash on global portfolio diversification, the effects of the 2008 crash have not been studied sufficiently. In this paper, we study this issue by comparing the co-movements of global stock markets in the 2003-2007 pre-2008-crash and 2009-2013 post-2008-crash periods with the Principal Components Analysis (PCA) technique. Our empirical findings show that the co-movements of global stock markets have become closer and the benefits of global portfolio diversification have decreased significantly after the 2008 stock market crash.

Key Words: 2008 stock market crash, Global portfolio diversification, Co-movements of global stock markets, Principal Components Analysis

JEL Codes: G11, G15

CO-MOVEMENTS OF THE WORLD'S STOCK MARKETS BEFORE AND AFTER THE 2008 STOCK MARKET CRASH: GLOBAL PORTFOLIO DIVERSIFICATION IMPLICATIONS

1. Introduction

Studying global portfolio diversification has been a popular research topic in finance. Empirical studies demonstrate the benefits of global portfolio diversification and identify the best global portfolio diversification prospects. The Co-integration Analysis (CA) and Principal Components Analysis (PCA) techniques are generally used in studying the co-movements of national stock markets. If two national stock markets are not co-integrated and if they do not have closely positively correlated movements, they are considered to be good prospects for global portfolio diversification.

Meric and Meric (1996 and 2004) study the long-term co-movements of national stock markets. Their findings indicate that the benefits of global portfolio diversification have been diminishing as national stock markets become more and more closely positively correlated in the long-run.

The effects of stock market crashes on the co-movements of national stock markets have received considerable attention in finance. Arshanapalli and Doukas (1993), Lau and McInnish (1993), Lee and Kim (1993), and Meric and Meric (1997 and 1998) study the co-integration between and the co-movements of national stock markets before and after the 1987 stock market crash. They find that there are less global portfolio diversification opportunities after the crash compared with the pre-crash period.

The 1987 and 2008 crashes are the two most important global stock market crashes since the Great Depression. Although there are many empirical studies on the effects of the 1987 crash on global portfolio diversification, the effects of the 2008 crash have not been studied sufficiently. The objective of this paper is to undertake such a study. The study covers the five-year period before the 2008 crash (the 2003-2007 period) and the five-year period after the 2008 crash (the 2009-2013 period). We compare the co-movements of 48 global stock markets during the pre-crash and post-crash periods with the PCA technique to determine if the 2008 crash has any significant effects on the co-movements of global stock markets and on the benefits of global portfolio diversification.

Our paper is organized as follows: the next section provides information about the effects of the 2008 financial/economic crisis on the world economy. In Section III, we explain our data and methodology. Section IV presents our PCA results for the 2003-2007 pre-crash period. Section V presents our PCA results for the 2009-2013 post-crash period. We summarize our findings and present our conclusions in Section VI.

II. The Effects of the 2008 Financial/Economic Crisis on the World Economy

The 2008 financial/economic crisis originated in the U.S., which officially went into recession in the fourth quarter of 2007. This eighteen month recession was later referred to as the

“Great Recession,” the longest and deepest U.S. contraction since World War II (Stock and Watson, 2012).

The “Great Recession” was unusual in that other countries experienced similar declines in GDP, consumption, and investment. These co-movements were much more closely synchronized than in earlier business cycles. Virtually all countries were affected (Bussiere, 2013). As shown in Table 1 below, the euro area (and the EU as a whole) suffered the most, “its worst financial and economic crisis” (Jeasakul, et. al., 2014). The Commonwealth of Independent States experienced a larger percent decline in GDP in 2009, but grew at respectable rates both before and after that year, albeit more slowly than before the crisis, whereas EU growth dipped into negative territory in 2012, and was at a standstill in 2013.

Table 1: Growth of Gross Domestic Product Based on Purchasing-Power-Parity % Share of World Total

<u>Country Group Name</u> ¹	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
World	3.8	5.1	4.7	5.2	5.3	2.7	-0.4	5.2	3.9	3.2	2.9	3.6
United States ²	2.8	3.8	3.4	2.7	1.8	-0.3	-2.8	2.5	1.8	2.8	1.9	2.8
Euro area	0.7	2.2	1.7	3.3	3	0.4	-4.4	2	1.5	-0.6	-0.4	1.0
Major advanced economies (G7)	2	3	2.5	2.6	2.2	-0.3	-3.8	2.8	1.6	1.7	1.2	2.0
Other advanced economies	2.7	4.9	4.2	4.8	5	1.7	-1.1	5.9	3.2	1.9	2.3	3.1
European Union	1.7	2.7	2.4	3.6	3.4	0.6	-4.4	2	1.7	-0.3	0	1.3
Central and eastern Europe	4.8	7.3	5.9	6.4	5.4	3.2	-3.6	4.6	5.4	1.4	2.3	2.7
Commonwealth of Independent States	7.7	8.1	6.7	8.8	8.9	5.3	-6.4	4.9	4.8	3.4	2.1	3.4
Developing Asia	8.6	8.6	9.5	10.3	11.5	7.3	7.7	9.8	7.8	6.4	6.3	6.5
Latin America and the Caribbean	2.1	6	4.7	5.6	5.7	4.2	-1.2	6	4.6	2.9	2.7	3.1
M East, N Africa, Afghanistan, Pakistan	6.8	7.9	6	6.7	5.9	5	2.8	5.2	3.9	4.6	2.3	3.6
Sub-Saharan Africa	4.8	7	6.3	6.4	7.1	5.7	2.6	5.6	5.5	4.9	5	6.0

¹ See the Appendix for the list of countries in each country group

² U.S. Dept. of Commerce, Bureau of Economic Analysis, based on chained 2009\$, except 2014

The pattern in the Central and East European region was similar to that of the CIS. Asia, as a whole, fared much better, with some countries (Australia, China, and Indonesia) avoiding an economic downturn entirely, and others recovering quickly after an initial downturn (Korea, Malaysia, and Singapore) (Jeasakul, et. al., 2014). The other regional groups experienced growth slowdowns rather than declines in GDP, except for Latin America and the Caribbean, which bounced back quickly after negative growth in 2009. After 2010, the world economy grew at a slower pace through 2013.

Going beyond 2013, world economic growth is expected to increase in 2014. This is illustrated in the projections for 2014 in Table 1. The World Bank, using different methodology, characterizes 2014 as a turning point. As indicated in Table 2, world economic growth is predicted to increase from 2.4% in 2013 to 3.2 % in 2014, and somewhat faster in the next two years. The high income countries are expected to contribute the most, led by the U.S. Developing countries are also expected to grow more rapidly in Europe and Central Asia, Latin America and the Caribbean, South Asia, and Sub-Saharan Africa. The Middle East and North Africa region is expected to come out of negative territory to grow at 2.8% in 2014 (World Bank, 2014).

Table 2: Outlook for GDP Growth

Real GDP growth ¹	2012	2013 ^e	2014 ^f	2015 ^f	2016 ^f
<i>World</i>	2.5	2.4	3.2	3.4	3.5
Memo item: World (2010 PPP weights)	2.9	2.9	3.7	3.9	4.0
High income	1.5	1.3	2.2	2.4	2.4
OECD Countries	1.4	1.2	2.1	2.2	2.3
Euro Area	-0.6	-0.4	1.1	1.4	1.5
Japan	1.9	1.7	1.4	1.2	1.3
United States	2.7	1.8	2.8	2.9	3.0
Non-OECD countries	3.5	2.5	3.3	3.7	3.8
Developing countries	4.8	4.8	5.3	5.5	5.7
East Asia and Pacific	7.4	7.2	7.2	7.1	7.1
China	7.7	7.7	7.7	7.5	7.5
Indonesia	6.2	5.6	5.3	5.5	5.5
Thailand	6.5	3.2	4.5	5.0	5.2
Europe and Central Asia	2.0	3.4	3.5	3.7	3.8
Kazakhstan	5.0	6.0	5.8	5.9	5.9
Turkey	2.2	4.3	3.5	3.9	4.2
Romania	0.7	2.5	2.5	2.7	2.7
Latin America and Caribbean	2.6	2.5	2.9	3.2	3.7
Brazil	0.9	2.2	2.4	2.7	3.7
Mexico	3.9	1.4	3.4	3.8	4.2
Argentina	1.9	5.0	2.8	2.5	2.5
Middle East and North Africa	1.5	-0.1	2.8	3.3	3.6
Egypt ²	2.3	2.0	2.2	3.1	3.3
Iran	-2.9	-1.5	1.0	1.8	2.0
Algeria	3.3	2.8	3.3	3.5	3.5
South Asia	4.2	4.6	5.7	6.3	6.7
India ^{2,3}	5.0	4.8	6.2	6.6	7.1
Pakistan ^{2,3}	4.4	3.6	3.4	4.1	4.5
Bangladesh ²	6.2	6	5.7	6.1	6
Sub-Saharan Africa					
South Africa	2.5	1.9	2.7	3.4	3.5
Nigeria	6.6	6.7	6.7	6.8	6.8
Angola	5.2	5.1	8	7.3	7
<i>Memorandum items</i>					
Developing countries					
excluding transition countries	4.8	5.0	5.4	5.6	5.8
excluding China and India	2.9	3.2	3.6	4.0	4.2

Source: World Bank, 2014.

Notes: PPP = purchasing power parity; e = estimate; f = forecast.

¹ Aggregate growth rates calculated using constant 2010 dollars GDP weights

² In keeping with national practice, data for Bangladesh, Egypt, India, and Pakistan are reported on a fiscal year basis in this table. Aggregates that depend on these countries are calculated using data compiled on a calendar year basis.

³ Read GDP at factor cost, consistent with reporting practice in Pakistan and India

III. Data and Methodology

The stock market index returns used in the study were computed with the MSCI global stock market indices downloaded from the DataStream database. The study includes all global stock markets in the database with no missing information for the 2003-2007 pre-crash and 2009-2013 post-crash periods. The following 48 global stock markets are included in the study:

Americas:

Argentina, Brazil, Canada, Chile, Colombia, Mexico, Peru, and U.S.A.

Europe:

Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, Turkey, and U.K.

Asia:

Australia, China, Hong Kong, India, Indonesia, Israel, Japan, Korea, Jordan, Malaysia, New Zealand, Pakistan, Philippines, Russia, Singapore, Taiwan, and Thailand.

Africa:

Egypt, Morocco, and South Africa.

Principal Components Analysis (PCA) is a statistical technique widely used in empirical studies to study the contemporaneous correlation between global stock markets. A detailed discussion of the technique can be found in Marascuilo and Levin (1983).

The PCA technique clusters global markets with similar movement patterns in the same principal component. Stock markets with high factor loadings in the same principal component are highly correlated and they can provide only minimal portfolio diversification benefit. Investors can maximize the benefits of portfolio diversification by choosing stock markets with high factor loadings in different principal components.

Makridakis and Wheelwright (1974), Philippatos, Christofi, and Christofi (1983), and Meric and Meric (1989) have used the PCA technique to study the contemporaneous co-movements of national stock markets. In this paper, we use the PCA technique to study the contemporaneous co-movements of 48 global stock markets during the 2003-2007 and 2009-2013 periods.

IV. Principal Components Analysis for the 2003-2007 Pre-Crash Period

To determine the principal components of the stock markets with similar contemporaneous movement patterns, the correlation matrix of the weekly returns of 48 global stock markets was used as input in the PCA computer program. The varimax rotation was used to maximize the factor loadings of the stock markets in each principal component with similar movement patterns. Using Kaiser's significance rule, the statistically significant principal components with eigen values greater than unity were retained for analysis.

The analysis yielded seven statistically significant principal components for the 2003-2007 period. The factor loadings of the seven principal components are presented in Table 3. The

Table 3: Principal Components Analysis for the 2003-2007 Pre-Crash Period

Countries	P.C. #1	P.C. #2	P.C. #3	P.C. #4	P.C. #5	P.C. #6	P.C. #7
France	0.894						
Germany	0.873						
Netherlands	0.864						
Switzerland	0.841						
Italy	0.827						
Belgium	0.814						
Spain	0.804						
U.K.	0.779						
Sweden	0.773						
U.S.	0.715					0.402	
Denmark	0.641						
Finland	0.632						
Ireland	0.585						
Israel	0.515	0.430					
Mexico	0.495					0.446	
South Africa	0.494		0.469				
Austria	0.482		0.460				
Canada	0.478						
Greece	0.467						
Hong Kong		0.742					
Singapore		0.735					
Korea		0.699					
Malaysia		0.695					
China		0.688					
Taiwan		0.661					
Indonesia		0.653					
Philippines		0.634					
India		0.612					
Japan		0.593					
Thailand		0.547					
Egypt		0.372	0.354				0.318
Hungary			0.728				
Russia			0.705				
Czech Republic			0.629				
Poland			0.623				
Norway			0.538				
Argentina			0.525				
Turkey		0.432	0.495				
Brazil	0.420		0.488			0.469	
Colombia			0.433				
New Zealand				0.777			
Australia	0.457	0.470		0.542			
Peru				0.406		0.376	
Morocco					0.648		
Pakistan	0.463				0.467		0.353
Portugal					0.464		
Chile	0.391					0.539	
Jordan							0.856
Variance Explained	24.2%	16.2%	11.1%	5.0%	4.3%	4.2%	2.6%
Cum. Var. Explained	24.2%	40.4%	51.5%	60.5%	64.8%	69.0%	71.6%

factor loadings of the stock markets with the highest loading in each principal component are shown in dark font. If a stock market also has somewhat high factor loading in any of the other six principle components, it is shown in light font.

The first principal component explains 24.2 percent of the total variation in the original data matrix. Mainly major European stock markets (such as the French, German, Dutch, Swiss, Italian, Belgium, Spanish, U.K., and Swedish markets) and the U.S. stock market have their highest factor loadings in this principal component. These stock markets are highly correlated and investing in these stock markets would provide minimal global portfolio diversification benefit to investors. Investors who invest in these stock markets would maximize the benefit of global portfolio diversification by investing in the stock markets with high factor loadings in the other six principal components. Although they have their highest factor loadings in the first principal component, several stock markets (the U.S, Israeli, Mexican, South African, and Austrian markets) also have quite high factor loadings in some of the other principal components. The investors of these stock markets should avoid investing in the stock markets with a high factor loading in these other principal components.

The second principal component is dominated mainly by Asian stock markets. These stock markets are highly correlated and investing in these stock markets would provide minimal global diversification benefit to investors. Global investors who invest in these stock markets would maximize global portfolio diversification benefit by investing in the stock markets with high factor loadings in the other six principal components. The Egyptian stock market also has its highest factor loading in this principal component. It implies that the Egyptian stock market is highly correlated with the other stock markets with high factor loadings in the second principal component. However, the Egyptian stock market also has a high factor loading in the third and seventh principal components. It implies that the investors who invest in the Egyptian stock market should avoid investing in the stock markets with a high factor loading in the third and seventh principal components as well as investing in the stock markets with a high factor loading in the second principal component.

Several European, South American and Asian stock markets have their highest factor loadings in the third principal component. It implies that these stock markets are highly correlated and investing in them cannot provide good global portfolio diversification. The investors in these stock markets should find stock markets with high factor loadings in the other six principal components to maximize portfolio diversification benefit. The results indicate that the Turkish stock market that has its highest factor loading in the third principal component also has a high factor loading in the second principal component. The Brazilian stock market that has its highest factor loading in the third principal component also has high factor loadings in the first and sixth principal components. The investors in the Turkish and Brazilian stock markets should avoid investing in the stock markets with high factor loadings in these other principal components to maximize global portfolio diversification benefit.

The New Zealand, Australian, and Peruvian stock markets have their highest factor loadings in the fourth principal component. It indicates that these stock markets are highly correlated and investing in these stock markets can provide little portfolio diversification benefit. The Australian stock market that has its highest factor loading in the fourth principal component

also has high factor loadings in the first and second principal components. The Peruvian stock market that has its highest factor loading in the fourth principal component also has a high factor loading in the sixth principal component. It implies that the investors in the Australian and Peruvian stock markets should avoid investing in the stock markets with high factor loadings in these other principal components to maximize global portfolio diversification benefit.

Because their return movements are significantly different from those of the other stock markets, the Chilean stock market has its highest factor loading in the sixth principal component and the Jordanian stock market has its highest factor loading in the seventh principal component. Although their highest factor loading is in another principal component, the U.S., Mexican, Brazilian, and Peruvian stock markets also have high factor loadings with the Chilean stock market in the sixth principal component. It implies that the investors in the Chilean stock market should avoid investing in the U.S., Mexican, Brazilian, and Peruvian stock markets to maximize global portfolio diversification benefit. Although their highest factor loading is in another principal component, the Egyptian and Pakistani stock markets also have high factor loadings with the Jordanian stock market in the seventh principal component. It implies that the investors in the Jordanian stock market should avoid investing in the Egyptian and Pakistani stock markets to maximize global portfolio diversification benefit.

V. Principal Components Analysis for the 2009-2013 Post-Crash Period

The analysis yielded five statistically significant principal components for the 2009-2013 post-crash period. The factor loadings of the five principal components are presented in Table 4. The factor loadings of the stock markets with the highest loading in each principal component are shown in dark font. If a stock market also has somewhat high loading in any of the other four principle components, it is shown in light font.

The returns of 29 major stock markets are highly correlated in the post-crash period and their highest factor loadings are in the first principal component. Investing in these stock markets would provide minimal global portfolio diversification benefit to investors. These include many stock markets from Europe, the Americas, Asia, and Africa. The U.K., Swedish, Norwegian, U.S., Canadian, Brazilian, South African, Australian, Mexican, Russian, New Zealand, and Argentine stock markets that have their highest factor loadings in the first principal component also have high factor loadings in the second principal component (i.e., the investors in these stock markets would get limited portfolio diversification benefit if they invest in the stock markets with a high factor loading in the second principal component). The Japanese stock market that has its highest factor loading in the first principal components also has high factor loadings in the third and fourth principal components (i.e., Japanese investors would get limited portfolio diversification benefit if they invest in the stock markets with high factor loadings in the third and fourth principal components).

Fifteen major stock markets have their highest factor loadings in the second principal component. Investing in these stock markets could provide minimal global portfolio diversification benefit to investors. Several stock markets with high factor loadings in the second principal component also have high factor loadings in the first and third principal

Table 4: Principal Components Analysis for the 2009-2013 Post-Crash Period

Countries	P.C. #1	P.C. #2	P.C. #3	P.C. #4	P.C. #5
France	0.907				
Germany	0.884				
Netherlands	0.882				
Italy	0.877				
Spain	0.870				
Austria	0.853				
Belgium	0.847				
Switzerland	0.818				
U.K.	0.815	0.441			
Finland	0.810				
Portugal	0.810				
Sweden	0.805	0.402			
Norway	0.783	0.462			
Ireland	0.755				
U.S.	0.750	0.451			
Canada	0.750	0.532			
Denmark	0.742				
Hungary	0.725				
Poland	0.706				
Brazil	0.674	0.602			
South Africa	0.673	0.544			
Czech Republic	0.669				
Australia	0.658	0.573			
Mexico	0.652	0.569			
Russia	0.629	0.560			
Greece	0.622				
New Zealand	0.596	0.460			
Argentina	0.470	0.364			
Japan	0.411	0.316	0.380	0.319	
Indonesia		0.759			
China		0.758			
Thailand		0.751			
Hong Kong		0.739			
India		0.718			
Malaysia		0.714			
Singapore	0.525	0.708			
Philippines		0.690			
Chile	0.445	0.670			
Korea	0.452	0.605	0.339		
Taiwan		0.579	0.421		
Colombia	0.436	0.554			
Peru	0.516	0.547			
Turkey	0.485	0.531			
Israel	0.444	0.496			
Pakistan			0.704		
Morocco				0.759	
Jordan					0.788
Egypt		0.368		0.359	0.473
Variance Explained	39.0%	23.2%	3.5%	3.2%	2.9%
Cum. Var. Explained	39.0%	62.2%	65.7%	68.9%	71.8%

components. The investors of these stock markets should avoid investing in the stock markets with high factor loadings in these other principal components to maximize global diversification benefit.

Because their return movements are distinctly different from those of the rest of the world's stock markets, the Pakistani stock market has its highest factor loading in the third principal component, the Moroccan stock market has its highest factor loading in the fourth principal component, and the Jordanian and Egyptian stock markets have their highest factor loading in the fifth principal component. These results imply that the investors in the stock markets with high factor loadings in the first two principal components could obtain significant portfolio diversification benefits by investing in the Pakistani, Moroccan, and Jordanian (or Egyptian) stock markets. However, although their highest factor loadings are in another principal component, the Japanese, Korean, and Taiwanese stock markets also have high factor loadings with the Pakistani stock market in the third principal component. It implies that investing in the Pakistani stock market would not provide substantial portfolio diversification benefit to Japanese, Korean, and Taiwanese investors. Although their highest factor loadings are in another principal component, the Japanese and Egyptian stock markets also have high factor loadings with the Moroccan stock market in the fourth principal component. It implies that investing in the Moroccan stock market would not provide substantial portfolio diversification benefit to Japanese and Egyptian investors.

V. Summary and Conclusions

Studying the benefits of global portfolio diversification has been a popular research topic in finance. Low correlation between national stock markets is often presented as evidence for the benefit of global portfolio diversification. The 1987 and 2008 crashes are the two most important global stock market crashes since the Great Depression. Although there are many studies that examine the effects of the 1987 crash on global portfolio diversification, the effects of the 2008 crash have not been studied sufficiently. In this paper, we study this issue with the Principal Components Analysis (PCA) technique.

To assess the effects of the 2008 stock market crash on the co-movements of global stock markets and on global portfolio diversification, we compare the co-movements of 48 global stock markets during the 2003-2007 pre-2008-crash period and the 2009-2013 post-2008-crash period. The results show that the movements of the 48 global stock markets are more closely correlated in the 2009-2013 post-crash period than in the 2003-2007 pre-crash period. This implies that the benefits of global portfolio diversification decreased from the pre-crash period to the post-crash period.

There are seven statistically significant principal components in the pre-crash period compared with only five in the post-crash period. This indicates that the co-movements of global stock markets are significantly closer in the post-crash period than in the pre-crash period. Only nineteen global stock markets have their highest factor loadings in the first principal component in the pre-crash period compared with twenty-nine global stock markets in the post-crash period. The first principal component explains only 24.2 percent of the total variation in the returns data

matrix in the pre-crash period. This percentage is 39 in the post-crash period. The first two principal components together explain only 40.4 percent of the total variation in the returns data matrix in the pre-crash period. This percentage is 62.2 in the post-crash period. These results indicate that the co-movements of global stock markets have become closer and the benefits of global portfolio diversification have decreased significantly after the 2008 global stock market crash.

Appendix – Composition of Country Groups:

Euro area

Composed of 17 countries: Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, Netherlands, Portugal, Slovak Republic, Slovenia, and Spain.

Major advanced economies (G7)

Composed of 7 countries: Canada, France, Germany, Italy, Japan, United Kingdom, and United States.

Other advanced economies (Advanced economies excluding G7 and euro area)

Composed of 14 countries: Australia, Czech Republic, Denmark, Hong Kong SAR, Iceland, Israel, Korea, New Zealand, Norway, San Marino, Singapore, Sweden, Switzerland, and Taiwan Province of China.

European Union

Composed of 28 countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Romania, and United Kingdom.

Central and eastern Europe

Composed of 14 countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Hungary, Kosovo, Latvia, Lithuania, FYR Macedonia, Montenegro, Poland, Romania, Serbia, and Turkey.

Commonwealth of Independent States

Composed of 12 countries: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. Georgia, which is not a member of the Commonwealth of Independent States, is included in this group for reasons of geography and similarities in economic structure.

Developing Asia

Composed of 29 countries: Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Fiji, India, Indonesia, Kiribati, Lao P.D.R., Malaysia, Maldives, Marshall Islands, Micronesia, Mongolia, Myanmar, Nepal, Palau, Papua New Guinea, Philippines, Samoa, Solomon Islands, Sri Lanka, Thailand, Timor-Leste, Tonga,

Tuvalu, Vanuatu, and Vietnam.

Latin America and the Caribbean

Composed of 32 countries: Antigua and Barbuda, Argentina, The Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, and Venezuela.

Middle East, North Africa, Afghanistan, and Pakistan

Composed of 22 countries: Afghanistan, Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates, and Yemen.

Sub-Saharan Africa

Composed of 45 countries: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Democratic Republic of the Congo, Republic of Congo, Côte d'Ivoire, Equatorial Guinea, Eritrea, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, São Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, South Africa, South Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia, and Zimbabwe.

Source: International Monetary Fund, World Economic Outlook Database.

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