CAPITAL MARKETS DURING POSTCRISIS AND PANDEMIC: A GLOBAL PERSPECTIVE (2008-2020) IN THE CONTEXT OF INDUSTRY 4.0

Daniela Serban
PhD Student
The Bucharest University of Economic Studies
Bucharest, Romania

Andreea Gabriela Tanase
PhD Student
The Bucharest University of Economic Studies
Bucharest, Romania

Cosmin-Octavian Dobrin
The Bucharest University of Economic Studies
Faculty of Managements, Management Department,
Bucharest, Romania

Viorel - Costin Banta
The Bucharest University of Economic Studies
Faculty of Accounting and Management
Information Systems, Management Information Systems
Department,
Bucharest, Romania

Abstract: This study examines, using intelligent technologies, the evolution of global capital markets during two defining periods of the past decade: the global financial crisis and the COVID-19 pandemic. Analyzing data from 46 developed and emerging markets, we investigate changes in total GDP, market capitalization, and the market capitalization-to-GDP ratio from 2008 to 2020. The findings highlight crucial trends and dynamics in the world's financial markets. Over this period, total GDP increased by nearly 39%, reaching USD 71.2 trillion, while stock markets expanded almost fourfold to USD 94.4 trillion, market capitalization exceeding by 32% GDP in 2020. The United States reaffirmed its leadership position, experiencing significant growth in both its economy and capital markets. Hong Kong, China, exhibited remarkable market capitalization-to-GDP ratios, reflecting accelerated market development. In contrast, smaller economies such as Cyprus and Mauritius faced challenges in keeping pace. With disparities for the financial crisis recovery, the year 2020, marked by the COVID-19 pandemic, led to market declines in 22 of the 46 observed markets, including both European and global economies.

JEL classification: E44; G18; G23; O16

Key words: stock markets; capital markets development; Global capital markets; macroeconomic development, Industry 4.0.

1. INTRODUCTION

When discussing capital markets, stock exchanges play a central role, and operating market infrastructures, listing instruments created to finance viable projects, routing investments from those with excess of capital – investors, to those in need of capital- issuers, of stock or bonds. The supply of capital comes from investors, retail or institutional, local or international, with available funding or capital who seek higher returns and accept risk when investing in capital markets. These markets serve to finance profitable investment projects which allow companies to grow, also boosting economic growth, by creating value added, new jobs, more taxes, and in the end economic growth. When looking at capital markets most often we look at their size, trading volume, and the capacity to intermediate capital flows, achieved through transactions such as Initial Public Offerings (IPOs), in which companies offer to investors stock or bonds. In Europe, markets are not on an upward trend, with decreased funding through IPOs and secondary offerings in the EU-27 from 2015-2019 compared to the US and the UK, as well as losing importance of European public capital markets. US has become once more in the history the leading capital market, in the past decade, confirmed by 2020 European Commission study (Oxera).

When companies issue shares or bonds with the purpose of obtaining financing, they also recognize additional benefits, such as partial exit or cash-in for the majority shareholder's owners and also gaining publicity, or possibility to lign employees' interest through stock option plans. However, all these factors come into play when favourable macroeconomic conditions and a positive tendency of stock markets are present to allow for a fair evaluation of the company. The competition for capital became more and more global, and in less developed countries, the financial system growth usually acts as a prerequisite of capital markets development, as banks are those offering high quality services for company's financing. Learning about influences on both sides, supply, and demand of capital, is a permanent concern of practitioners, as well as academics and policymakers. In addition, the regulatory and technical frameworks set a well-functioning market, which allow policymakers to further encourage capital markets development, directly or indirectly, and private individuals and companies using instruments for their needs.

This paper analyses how capital markets and countries they operate in performed past two major events in the last decade, global financial crisis and pandemic. This research explores the evolution of selected 46 global stock markets from 2008 to 2020, including both mature and developing markets. By analysing GDP and market capitalization, including stock market capitalization-to-GDP ratio, this study draws on the changing landscape of European and also global capital markets in the post-financial crisis and pandemic era.

The following chapter includes a short review of the literature and the last one concludes.

2. LITERATURE REVIEW AND GLOBAL STOCK MARKETS

Several well known authors have been researching the link between economic growth and the impact of Capital markets on value added formation within economies, starting with Schumpeter (1911), more recently followed by King and Levine (1993), Levine and Zervos (1998), Demirgüç-Kunt and Levine (1996, 2008), García and Liu

(1999). Numerous other authors, Beck et al. (2000), and Ergungor (2008), Serban and Ivascu (2020), have looked at countries, or regions and majority has proven the link between economic growth and capital markets, in both directions. By evaluating, selecting, managing and financing entrepreneurship and increasing productivity financial markets have an impact on the economic growth.

Capital market development has a significant relationship with long-term economic growth, attracting capital for productive investments (Levine and Zervos, Beck et al.). Developed capital markets are linked to better financial intermediaries (Demirgüç-Kunt and Levine, García and Liu). Also, stock markets and banks can complement each other (Boyd and Smith, Pagano) in emerging markets, reaching a substitution effect in others, more developed ones.

Academics has shown along time that developed capital markets tend to become more developed and smaller ones remain or decline in terms of size and attractivity, moreover in the context of ease move of capital and globalisation.

A study by the European Commission (2020) shows a declining trend in new listings in Europe, which is also a global trend of decreasing attractiveness of public equity markets. The average value of listed companies is higher, but companies are taking longer to list than before. European capital markets are losing importance, with larger and older listed companies. Delistings in the EU-27 surpass new listings, study shows. Demertzis et al. (2021) note the underdevelopment of EU capital markets compared to the US, with European companies relying more on bank financing. The number of listings in the EU-28 decreased by 12% in 2018 compared to 2010, while in the United States, it increased by 5% from 2010 to 2018. Delistings in the EU-27 have consistently exceeded new listings almost every year in the period from 2010 to 2018 and continue to rise, while the number of new listings is more volatile.

The total funding raised through Initial Public Offerings (IPOs) and secondary offerings in Europe-27 declined by more than half from 2015 to 2019, while in the United States, it increased by 20% and remained relatively stable in the United Kingdom. These disparities deepened, particularly regarding IPOs, amid the pandemic. In the first 9 months of 2020, the United States attracted the majority of listings, with record funding exceeding USD 100 billion from IPOs, while listings in Europe-27 raised less than USD 9 billion, and those in the United Kingdom less than USD 3 billion. The listing of so-called unicorns (companies with a market value of over USD 1 billion) once again reflects global trends. Between 2014 and 2018, 100 unicorns went public in the US, while only 8 did so in Europe (of which 3 were in the UK). Half of the unicorns listed in European countries conducted IPOs in the US to take advantage of a more favorable regulatory framework and, in general, a stronger ecosystem, Oxera study shows.

In this study, 46 markets and countries were observed, starting initially from all possible countries and markets, from around 60 stock markets existing in the world. Data sources for this study include the World Bank (WB), individual stock exchange websites. The collected data for GDP are at current U.S. dollars, calculated as the sum of gross value added by all resident producers in the economy, with any product taxes added and subsidies not included in the value of the products subtracted. These GDP figures are converted from domestic currencies to U.S. dollars using the official exchange rates for the respective years. Market capitalization, often referred to as market value, is computed as the product of share price and the number of outstanding shares (across various classes) for domestically listed companies. Excluded from this calculation are investment funds, unit trusts, and firms whose primary business objective is holding shares of other listed companies. The data provided here represents end-of-year values, converted to U.S. dollars using corresponding year-end foreign exchange rates. Own calculations are applied to generate the Market Capitalization to GDP data. Market capitalization, whether used in isolation or in relation to GDP, serves as the most commonly metric for estimating the size of a capital market. Researchers such as García and Liu (1999), Şükrüoğlu and Nalin (2014), and Draženović and Kusanović (2016) utilize the market capitalization-to-GDP ratio to assess the development of capital markets. This ratio, relative to GDP, is seen as the most comprehensive measure of a country's capital market development and offers a cross-country comparison indicator. Nevertheless, it is important to note that this indicator can become distorted during periods of significant price increases, which may not necessarily reflect changes in market operations impacting market development.

In general, lack of data for conglomerates made them excluded from the research, and also some smaller stock exchanges.

In 2020 top 10 largest capital markets in the world are shown in Figure 1, with their respective sizes for market capitalization. More than 42% of the analysed sample total market capitalization is attributed to the United States, with 40,719 billion USD, followed by China, with the two combined exchanges - Shanghai Stock Exchange and Hong Kong Stock Exchange, reaching almost half of the United States The New York Stock Exchange. World elite is followed by London Stock Exchange, United Kingdom, Japan, with Tokyo Stock Exchange, Canada, India, Saudi Arabia, Germany, and Korea concluding TOP 10.

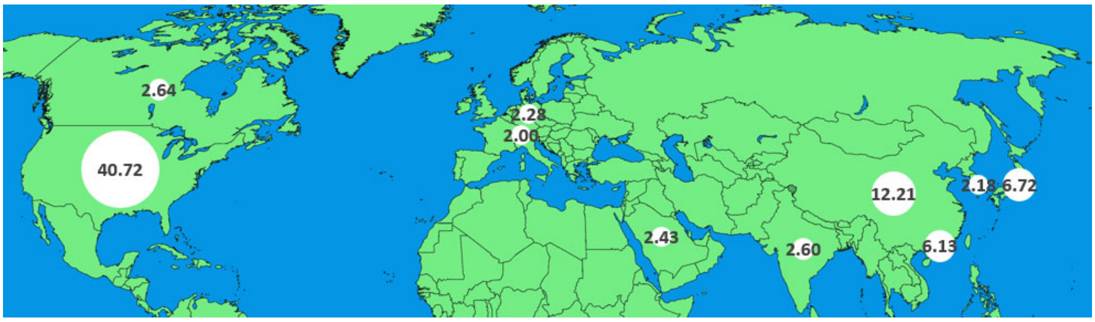

Figure no. 1 – Largest stock markets by capitalization, 2020, trillion USD

Table 1 takes a snapshot of the evolution of three key indicators followed in this research, during 2008, the debut of the economic crisis and 2020, year of the COVID-19 global pandemic. One can note that during the time period total GDP increased by almost 39%, up to 71,247 trillion USD. In the meantime, stock markets have increased almost 4 times, up to 94,447 trillion USD, with 32% more than GDP for 2020. Overall the analysed period was one with overall economic and capital market developments.

United States consolidated its leadership position both as economy, and as capital market. Accelerated development occurred though in Hong Kong, China, with a spectacular 1,777% Market capitalization to GDP, from a remarkable 606% in 2008. Among the smallest countries and markets one can observe Cyprus and Mauritius in 2020. Malta grew more over the past years than any other EU country, data show, with a population growth, also after joining the EU in 2004. Romania is found the last among the 46 countries with the lowest Market Capitalization to GDP both in 2008, 7%, and 2020, 10, capital market recording a growth in terms of size as market capitalization, but at a slower pace than the economy.

On average we can notice a market capitalization to GDP of 132% in 2020, more than double the 2008 average, with faster growing capital markets than economies.

Table 1 **Description of Data**

Indicator	GDP USD mn	Market capitalization USD mn	Market capitalization to GDP %
Total 2008	51,336,674	29,486,063	N/A
Total 2020	71,247,498	94,447,552	N/A
Minimum 2008	9,090	3,567	7.07
	Malta	Malta Stock Exchange	Romania
Minimum 2020	11401	4,693	10.1
	Mauritius	Cyprus Stock Exchange	Romania
Maximum 2008	14,769,900	11,590,277	606
	United States	The New York Stock Exchange	Hong Kong SAR, China
Maximum 2020	21,060,500	40,719,661	1,777
	United States	The New York Stock Exchange	Hong Kong SAR, China
Average 2008	1,092,270	641,001	60
Average 2020	1,515,904	2,146,535	132

Data: World Bank, stock exchanges

In the sample, most of the countries recorded economic growth during the period, largest being in China, India, Indonesia and Sri Lanka, of more than 100% GDP growth. In Europe, Malta stands out with more than 65% growth. United States economy grew by more than 42%. Only 13 countries recorded decline in GDP during 2008-2020, mainly Greece, 47%, followed by Ireland, Spain and Italy, with more than 20%. Declines also occurred in Brazil, Cyprus, United Kingdom, in the context of Brexit, Turkey, or Iran.

In terms of capital markets, only 8 declined during 2008-2020, among the smallest or with conflicts, such as Egypt. Other markets declining were in Jordan, country affected by pandemic, Greece, still recovering from the financial crisis with capital markets being downgraded by global rating agencies from developed to emerging category, in 2013. Small markets such as Slovenia, Cyprus, Luxembourg or Oman registered lower market capitalization in 2020 than in 2008. A special case is Iran, where the economy dropped overall, but since the United States imposed sanctions on Iran in 2018 stock market increased several times, mainly due to inflation, in the context of currency depreciation.

Notable increases in the Market capitalization to GDP indicator were recorded in markets such Saudi Arabia, South Africa, Switzerland and United States, with growing capital markets faster than the economy.

Over the years, more countries in Europe experienced declining GDP during 2012 and 2013, including Greece, Spain, Italy, and Hungary. Other countries exhibited modest annual GDP growth rates, under 2% during the same period. This shows disparities in the recovery after the financial crisis, much dependent on the case-by-case situation.

Pandemic year 2020 brought capital markets declines in size in 22 among the 46 markets worldwide, with declines both in European countries, as well as Asian or Latin America. In 2020, compared to 2019 largest drops in market capitalization occurred in Mauritius, more than 28%, followed by Colombia and Brazil, reaching in Europe to Hungary, almost 15%.

GDP, market capitalization and market capitalization to GDP are stationary data at level and are cointegrated. Thus, using VECM to test their long-term relationship was not possible. As shown in Figure 2, correlation analysis showed a strong positive relationship of 0,84 between GDP and market capitalization, and a significant one.

Covariance Analysis: Ordinary
Date: 10/15/23 Time: 23:38
Sample: 2008 2020
Included observations: 591
Balanced sample (listwise missing value deletion)

Correlation Probability	MKTCAP	GDP
MKTCAP	1.000000 -----	
GDP	0.839407 0.0000	1.000000 -----

FIGURE NO. 2 CORRELATION ANALYSIS, EVIEWS

Using Hausman test for an OLS regression leads us to a nonvalid equation, with each GDP or market capitalization variables as dependent ones, thus more study will follow in adding more variables.

3. CONCLUSIONS

In the dynamic space of global markets, this research brought emphasize on general trend of large capital markets becoming more developed, but also to numerous situations showcasing country by country specifics with influence on the capital markets, but also the overall dynamics of capital markets and their economies during 2008-2020.

The analysed period offeres some takeaways:

1. **Economic and Capital Market Growth**: The analysis reveals that, between 2008 and 2020, there was substantial growth in both total GDP and global stock market capitalization. While total GDP increased by almost 39%, reaching USD 71.2 trillion, stock markets expanded nearly fourfold, reaching USD 94.4 trillion. This indicates an overall period of economic and capital market development.

2. **Leadership and Growth**: The United States consolidated its position as a leader in both the global economy and capital markets. Notable acceleration in development was observed in Hong Kong, China, with a remarkable market capitalization-to-GDP ratio of 1,777%, up from 606% in 2008. In contrast, smaller countries like Cyprus and Mauritius struggled to keep pace in 2020. Malta, having experienced significant population growth after joining the EU, stood out with

more than 65% economic growth. Romania, on the other hand, lagged behind among the 46 countries, with minimal market capitalization growth.

3. **Market Capitalization-to-GDP Ratio**: On average, there was a noteworthy increase in the market capitalization-to-GDP ratio, standing at 132% in 2020, more than double the 2008 average. This suggests that markets grew at a faster pace than their respective economies, indicating the growing significance of these markets.

4. **Economic Growth and Market Performance**: The study found that the majority of countries experienced economic growth during the period, with notable growth rates in countries like China, India, Indonesia, and Sri Lanka, surpassing 100%. In Europe, Malta exhibited significant growth of over 65%. The United States recorded more than 42% economic growth. However, 13 countries experienced declines in GDP during 2008-2020, including Greece, Ireland, Spain, and Italy, mainly due to various economic challenges.

5. **Market Performance During the Pandemic**: The year 2020, marked by the COVID-19 pandemic, witnessed market declines in 22 out of 46 markets worldwide, including several European, Asian, and Latin American countries.

6. **Correlation Between GDP and Market Capitalization**: Correlation analysis showed a strong positive relationship of 0.84 between GDP and market capitalization, indicating that these two factors are closely intertwined.

Furthermore, this research highlights the link between economic conditions and the stability of stock markets worldwide, with United States strengthening even more their global leading position, and Asia growing fast. Smaller markets in general struggled to grow or even declined, with some exceptions of sharp public policies. These findings offer valuable insights into the changing landscape of capital markets and the complex influence between economic growth and financial systems, serving as a foundation for future research and policy considerations.

REFERENCES

1.	Beck, T., Demirgüç-Kunt, A. (2009)	„Financial institutions and markets across countries and over time: Data and analysis”, Washington, DC: World Bank, Policy Research Working Paper, no. 4943.
2.	Beck, T., Levine, R., (2004)	„Stock markets, banks, and growth: Panel evidence”, Journal of Banking and Finance, no. 28: 423-442.
3.	Boyd, J., Smith, B., (1996)	„A Symposium Issue on Stock Markets and Economic Development”, The World Bank Economic Review, Vol. 10, No. 2, (May, 1996), pp. 371-396
4.	Demirgüç-Kunt, A.,	„Stock market development and financial intermediaries: Stylized facts”, The World Bank Economic Review, no. 10:

Levine, R., (1996) 291-321.

5. Draženović, B.O., Kusanović, T., (2016) „Determinants of capital market in the new member EU countries", Economic Research-Ekonomska Istraživanja, vol. 29, no. 1: 758-769.

6. Ergungor, O. E., (2008) „Financial system structure and economic growth: Structure matters", International Review of Economics and Finance, vol. 17(2): 292-305.

7. European Commission, (2020) „Primary and secondary equity markets in the EU Final report", Oxera

8. García, V. F., Liu, L., (1999) „Macroeconomic Determinants of Stock Market Development", Journal of Applied Economics, no. 4: 29-59.

9. King, R. G., Levine, R., (1993) "Finance and Growth: Schumpeter Might Be Right?", The Quarterly Journal of Economic, no. 108:717-737.

10. La Porta, R., Lopez-De-Silanes, F., Shleifer A., Vishny, R.W., (2007) „Legal Determinants of External Finance", The Journal of Finance, Jul., Vol. 52, No. 3.

11. Levine, R., Zervos, S., (1998) „Stock Markets, Banks, and Economic Growth", American Economic Review, vol. 88, no. 3: 537-558.

12. Pagano, M., (1993) „Financial Markets and Growth: An Overview", European economic Review, no. 37: 613-622.

13. Schumpeter, J. A., (1911 „The theory of economic development" Cambridge, MA: Harvard University Press.

14. Serban, D., Ivascu, C. (2020) „Role of Capital Markets in the Post-Crisis Economic Recovery", 35th IBIMA Conference, Spain

15. https://data.worldbank.org/