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What are the key factors of emerging markets for their economic recovery and growth after COVID-19?

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Abstract

Various elements shape economies around the world and emerging markets are one of the major aspects of the global economy, especially after COVID-19. The factors influencing these emerging markets are quite necessary for monitoring as they maximize the interest of each market and facilitate it as a safety tool for any kind of future events. The purpose of this study is to find key factors that influenced emerging markets in economic crises to reestablish their trajectory and see effective development, especially focusing on the years' post-COVID-19. The factors that affect each economy have their efficiency ratio; each factor is not equally effective in every economy. As our concern is the emerging market economy, which sits in the middle between developed and underdeveloped economies, the factors that are influencing them include manufacturing, services, technology, entrepreneurship, etc. The findings assessed the statistical data of the World Bank on 40 emerging markets from the annual year 2008 to 2022, to show four structural key factors including manufacturing, foreign direct investment (FDI), tax revenue, and internet users in the population (IUI) have a high impact on each nation's gross domestic product (GDP) growth. The study utilizes econometric models and evaluation was done through regression, correlation, and descriptive analysis along with time series graphs to visualize their impact on GDP. The article has some limitations as other key structural factors involving broad money, domestic credit to the private sector by banks (DCPSB), research and development (R&D), trade, and trade in service do not create appropriate results to validate their role in these emerging markets. Unlike other studies, this study is effective as it introduces a new insight into economic growth, filling the gap in existing literature on emerging markets in the recent era due to the COVID-19 pandemic.

Keywords: GDP Growth; Key Factors; Post COVID-19; Emerging Markets; Economy; FDI; Manufacturing

1. Introduction

The economy generally increases its capacity by ensuring maximum productivity that enables higher supply, which is marked as economic growth. On the other hand, economic recovery is more about how much fluctuation of elements an economy can take and the capacity of sustainable factors working for it. Growth and recovery complement each other in the economic system. In 2020, the COVID-19 breakout had a huge effect on the global economic cycle and one of the main factors was the need for total shutdowns of areas to cities and initially the countries. This kind of global pandemic caused a complete shutdown of the global economy. This kind of global pandemic caused a complete shutdown of the worldwide economy, which reduced total output generation by 33 percent, resulting in a loss of 9 percent of global GDP [1]. COVID-19 causes tangible and intangible expenses, greatly affecting economies in various ways[2-7]. The short-term impacts include immediate losses of human lives and resources, health problems for those infected, and disruptions to consumer and business activities. In the long term, COVID-19 led to disruptions in various economic activities and decreased productivity. According to Khan, Khan [8], tangible effects include lower national income, slower economic growth, reduced global trade, less domestic and foreign investment, decreased tourism revenue, and higher unemployment, exports, and inflation. The global economy shifted to recovery and subsequent growth, and the

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way it did is quite interesting. According to Brada, Gajewski [9] states the European financial sectors show factors like flexibility among economic systems, and clustering of high and low-performing areas to reduce income disparities. In Asia, countries like China made rapid resilience by focusing on risk management mechanisms, Macroeconomic policies, etc. [10]. These factors mainly indicate various tools that were practically implemented by developed nations.

The global economic scenarios are different in developed and developing markets. According to Lin [11], developing markets mainly focus on factor endowment, structural changes, and sustainable goals. The developing countries are also called emerging markets. Some of them believe in the way directed by the developed countries, and some differ in opinions. On a global scale, for a long period, manufacturing has been viewed as a growth driver of economies in developing countries from 1990 to before COVID-19 and there is no exact evidence of it losing its importance on such a scale [12-18]. Besides, many researchers argue that the emergence of deindustrialization in the twenty-first century in many developing economies has made them more advanced such as Asia and Latin America, which are mostly service-based economies where almost 70 percent of GDP comes from various services [19]. India is a prime example of the developing economy's service sector including software, tourism, business processes, etc. [20]. As far as informal factors are concerned, some argue that all of the effects of factors cannot be explained by traditional models as they fail to explain the effects of technology and innovations. Furthermore, the manufacturing factor of technology and innovations is quite important in economies [21-24]. While talking about informal factors, one factor that made a very large impact in all the regions is opportunity entrepreneurship. It faced a huge demand in emerging markets in Latin America as a knowledge-based platform to give growth to the economy [25]. Therefore, emerging markets can be viewed as focusing more on service, manufacturing, entrepreneurship, and technology before the arrival of COVID-19.

Weiss, Schwarzenberg [26] emphasize that in the first quarter of COVID-19, the World Trade Organization (WTO) forecasted global trade volumes to decrease between 13 percent to 32 percent in 2020 as a result of the economic impact of the coronavirus pandemic. The author also highlights that according to the International Labor Organization (ILO), the coronavirus crisis wiped out 6.7 percent of working hours globally in the second quarter of 2020 [26-32]. However, COVID-19 has severely impacted the economy, leading to the closure of thousands of SMEs and millions of job losses [33]. In the meantime, the amazing power of the entrepreneurial mindset has been clear, as entrepreneurs around the world have shown strength, determination, and skill in finding or creating opportunities in tough times. The COVID-19 pandemic caused a serious economic crisis that hit emerging markets hard. These countries faced big challenges as the outbreak disrupted key industries, weakened financial systems, and revealed problems in infrastructure, healthcare, and government. Recent research has shown a rapid rise in opportunities for entrepreneurs during the pandemic and beyond. Maritz, Perenyi [33] state key factors including the need for social distancing, home-centered activities, and physical isolation have boosted opportunities in areas such as flexible manufacturing, online education, emergency management, healthcare analytics, senior care, telemedicine, digital microfinance, supply chain resilience, remote communication platforms, multiplayer entertainment, fitness equipment, remote tech support, and smarter city technologies[34-38]. One of the biggest game changers after COVID-19 is e-commerce and e-business technologies. They not only bridge the gap of isolation of customers and sellers but also foster a new way of data-driven business modeling. When consumers all turned to using online platforms, the hike was much more than expected [39]. Peer-to-peer (P2P) selling became one of the easiest tools for doing business as well as feedback and support between buyer and seller [40]. Moreover, the use of digital technology to tackle COVID-19 to bring back the normal way of living like digital surveillance to mitigate the crisis is immense [41]. Additionally, COVID-19 has digitally transformed the service sector into a more sustainable form of action, such as telehealth medicine services. A structural change in the global economy has been found in this devastating period, the vastly impacted sectors are manufacturing, retail, tourism, transport, etc. [42-47].

The pace and nature of the post-COVID-19 economic recovery differed greatly among regions such as Asia, Africa, and Latin America due to variances in structural resilience, government policies, and external dependencies [48]. Also, the World Bank's role as a crisis lender is typically overshadowed by the IMF [49]. While the recovery trajectory will vary by each region and country, several common drivers and challenges are expected to shape their economic growth in the coming years, in emerging scenarios, and finding the correlation between the found data and the probable discovery of evidence-based answers. The study focuses on the annual years 2008 to 2022, to analyze emerging markets before and post-COVID-19, by examining trends in global GDP in nine key structural factors[50-55]. Understanding the pandemic's effects will create the groundwork for investigating recovery plans and identifying the elements that have allowed some economies to recover more quickly than others. This study provides a deeper comprehension of post-pandemic economic recovery. It equips us with the knowledge to offer insights on future growth strategies, with a new generation of information to navigate a complex economic landscape in emerging markets.

2. Literature Review

According to Barua [56], after covid-19, the global economy can see events from recession to even depression. The study finds that the pandemic has an effect on sectors of the economy, and this causes a lack of supply and demand for every single sector, including basic trade, to even unemployment. The predictions show stagflation in economies, but there is a chance of U-shaped recovery as well. The study advises that focusing on optimal choices through innovative policies and global collaboration is a necessity. According to Wang and Zhang [57], China's economic recovery was crucial in terms of the global economic recovery. The study finds that China's recovery made a positive spillover effect on almost 80 percent of the countries in the globe and the effect lasted mainly on low-middle-income countries for the part of energy consumption. The study advises that global stakeholders should place more focus on international trading through exchange and collaboration. According to Asafo-Adjei, Boateng [58], the financial sector and economic growth interact with each other in markets. The study finds that the financial sector always plays a first mover approach every time economic growth occurs, they have a two-way relationship, and interestingly, this interdependence on each other was not that strong before COVID-19. The study advises keeping an eye on these trends to understand why it's changing[59-64]. According to Caballero-Morales [65], innovation is a key factor in the recovery of small and medium enterprises. The study finds that SMEs made use of various technological communication platforms during the crisis period to operate businesses and deal with clients. The study suggests implementing more innovation in this manner for SMEs as a precaution, following adapting to the new dynamics of the economy. According to Pu, Qamruzzaman [66], in Bangladesh, SMEs have seen an integration between the innovation of finance and technological adaptation where the government played a crucial role. The study finds SMEs recovered their operation mainly through technological adaptation such as e-commerce banking and government monetary supports such as credit extension, and low-margin credit plans. The study suggests that more policies should be taken that encourage technological adaptation for future events. According to Suyunchaliyeva, Nautiyal [67], the mobile payment system facilitated the recovery of economic sectors such as goods and services, especially in tourism. The study finds that users' innovative personalization and building trust in mobile financial systems created a proper network that allows sectors such as tourism to resume again. The study advises to take a proper view on this trend extensively [68-72].

According to Chudik, Mohaddes [73], the global threshold augmented var model affects economies during COVID-19. The study finds that countries that prioritized fiscal policies benefited more than others. Still, there are factors such as geological factors and even a spillover effect by trade and finance policies. The study advises implementing a risk management policy to safeguard other initiatives. According to Meyer, Prashantham [74], entrepreneurs positively impacted the economy in the covid-19 era. The study finds that entrepreneurs showed resilience by adapting to the contemporary environment through network relationships and digital technology such as in China, where they were influenced by institutional frameworks, access to resources, and market volatility. The study advises exploiting future knowledge on how exactly entrepreneurship deals with externalities. According to Chudik, Mohaddes [75] and [76-81], developing a threshold augmented dynamic multi-country model helps to analyze the global economic scenario. The study finds that developed economies are going to face severe downturns compared to emerging markets, here long-term interest rate is a valid reason. The policy intervention was a game-changing tool for the whole revival of the economy. The study advises that the policy intervention should cover the industry to households.

According to Qamruzzaman and Jianguo [82], there is an asymmetric relationship between financial development, trade openness, foreign capital flows, and renewable energy consumption. The study finds that in the long run, there is an asymmetric relationship between all of the factors across all levels of income, but in the short run, it is almost similar, except low-medium-income countries. The study suggests that policy implications depend on income level while considering consumption of renewable energy. According to Khamis, Prinz [83], the covid-19 made a huge negative impact on the labor market in developing countries. The study finds that by using high-frequency phone surveys, there is high work reduction, job changes, and income loss in emerging markets, mainly in Sub-Saharan Africa. Furthermore, [84-90]advises that to invest more in data-developing indicators for faster recognition and solution of issues.

According to Chang, Brown [91], small businesses faced more challenging scenarios than others. The study finds that one of the reasons for their crisis is an adequate supply chain. The study advises for a conceptual framework on resilience, and implementation of policies accordingly. According to Kaneva, Chugunov [92], the tax sector in the economy needs to be reformed for the post-pandemic era. The study finds that maintaining optimal tax levels and assessing tax structure is necessary for long-term effects on economic growth. The study advises for focus on employment and GDP ratio rather than raising taxes. According to Jiang, Wang [10], China's overall fast recovery has many implications globally. The study finds that the overall recovery was only possible because of their risk-taking ability. The advice is to focus on risk management and more well-designed policies. According to Modgil, Dwivedi [93], The healthcare sector reformation is very crucial. The study finds that the involvement of AI in this sector is very much

optimal as operations become improved on many ends. The study suggests collaboration between startups and business sectors can create high possibilities in reality.

According to Al-kasasbeh, Alzghoul [94], FDI inflows are influenced by various nations' attributes according to their GDP size and trade flexibility. The study suggests Policy reform, green investment, and Country-specific strategies. According to Rogoff [95], depending on foreign capital and short-term loans has a high risk of financial crisis. The study advises that of the Debt transparency and strengthening fiscal discipline. According to Negrete-Cardoso, Rosano-Ortega [96], Implementing comprehensive policies in the circular economy is the key alternative to green recovery after COVID-19. The study suggests a Circular economy of plastic waste. According to Wang, Cui [97], The epidemic affected the transmission of financial institutes and businesses. They suggest developing strong indicators to monitor green economic success and investing in R&D. According to Takyi, Dramani [98], COVID-19 has affected developing countries in a particular manner. Their study finds that a total of six countries' economies were mostly negatively impacted, and the reasons are their dependence on higher human interaction sectors such as hospitality, tourism, and aviation. The findings suggest that real economic factors, users are hardly impacted, therefore focusing on these policies for recovery. According to Telfah, Chau [99], the financial market and natural resource utilization can act as green economic recovery. This study finds that resource utilization can ensure economic growth without harming the environment. The financial markets are sensitive compared to manufacturing capacity, a relationship between monetary policies, supply, and output. The findings suggest that natural resource management, fair distribution, and sustainable production are necessary to acquire a green economy. According to Kaftan, Kandalov [100], social and economic stability requires sustainable development. The study finds that the pandemic exposed the cons of an interconnected global economy. Innovation and technology play a major role in a sustainable economic environment, such as for SMEs. The study suggests that world leaders should adapt to the new era of technology-based economies and take sustainable approaches.

According to Zhang, Anser [101], sustainable development goals and resource utilization can make a green economic recovery for a more resilient structure. The study finds that finance related to green structures can assure greater risk-free returns. A technology-based energy sector can be more efficient. The green economic sector can solve various geopolitical issues. The study also advises that adapting to a green economic system is necessary for the environment, growth, resilience, and sustainability. Therefore, every country must return from how Covid-19 has affected them. According to Haldar, Sucharita [102], technology and renewable energy can positively affect the growth of emerging economies. The study finds that information and communication technology foster economic growth, and electricity consumption is a necessity for each economy in general. However, innovation tends to have adverse effects on growth, and ICT intensifies the negative impacts of trade. The study suggests emerging markets should increase connectivity for a bigger financial market while ensuring sustainable energy development.

According to Uddin and Rahman [103], economic factors such as inflation, unemployment, and corruption affect the economic growth of emerging markets. The study finds that unemployment and corruption negatively affect the economy, whereas inflation positively affects the economy. Other factors are also mentioned, such as government effectiveness, political instability, and law enforcement. The study suggests that the government has a major role to play in implementing effective policies. According to Balsalobre-Lorente, Shahbaz [104], globalization has an impact on the environment while considering it as one of the key elements for global economic growth. The study finds that globalization increases carbon emissions and it affects the environment more negatively. However, renewable energy and economic complexity reduce the negative effects. The study advises the proper implementation of environment-friendly policies that increase the complexity of the economy with the usage of renewable energy. According to Okoro, Oladeinde [105], digital communication has a major role in economic growth. The study finds that the Internet, mobile communication, the Internet of Things, etc. have a major role in economic growth as it affects productivity, employment, and GDP. However, it challenges new divides and threats in economies. The study suggests proactive policy implications in the sector and also future studies on how it affects sustainable economic developments.

According to Iskandar, Muhajir [106], variables of the institutional segment influence economic growth. The study finds that variables like accountability, political stability, absence of violence, and government effectiveness have no impact in the East Asia region. On the other hand, regulatory quality and control of corruption have a strong positive impact on economic growth. The study suggests that for long-term economic growth, increased regulatory quality is a very good option along with changes in frameworks. According to Chen, Wang [107], there is a relationship between a green economy and economic growth in developing countries in Asia. The study finds that in developed countries, urbanization and green economy increase the growth of economies, but in developing countries, it does the opposite. The study suggests the development of natural resources and the protection of the ecosystem. According to Bruhn, Demirguc-Kunt [108], the recoveries of firms can be classified by size and competition. The study finds that in most cases small firms were affected largely, but the one with the highest productivity, without considering the highest, made

the recovery. However, the interference of government was more on large and less productive firms, which is indeed troubling. The study advises that the government should put effort into productivity through adequate management control.

According to Ullah, Ullah [109], FinTech, governance, and environmental taxes affect energy transition. The study finds that fintech, globalization, and environmental taxes affect energy transition positively but inflation, COVID-19, and urbanization do the opposite. The study suggests implementing efforts to enhance the transition of energy consumption. According to Alharbi [110], Small and medium enterprises faced a negative impact of COVID-19, and recovery from this issue is mandatory. The study finds that SMEs lack loans, they require digital transformation, and the entrepreneurs require more financial knowledge and skill development. The study suggests the government provides appropriate support to those who need it, such as financial resources.

According to Aripin, Agusiady [111], after Covid-19, the banking sector and micro, small, and medium enterprises need to implement new strategies and sustainable goals. The study finds that these two sectors need to adapt to digital transformation along with cross-sector collaboration and follow proper risk management strategies. The study advises making necessary changes with long-lasting goals. According to Arellano, Bai [112], debt in the economy created a crisis in the COVID-19 period. The study finds that almost one-third of the health crisis might have been tackled if the economy was in stable condition and the issue was debt. The study suggests that one kind of relief fund should be managed separately to back the spending necessary for the people in the economy. According to Herman and Oliver [113], digitalization of trading for the betterment of economic growth. The study finds that digital trading by internet connectivity, trade provision has a positive correlation. The service sector in every economy benefits from it, and it also mutually benefits each country by ensuring improved growth in international business and GDP. However, if economies do not adapt, they might lag and face disparity. The study suggests that developing countries must adapt and supportive policies must be taken.

According to Sun, Li [114], digital trading and usage of mineral resources affects economic growth. The study finds that sustainable economic growth has a positive reaction from foreign direct investment, and e-commerce, but urbanization, mineral resources, and unemployment negatively. The study advises focusing on digital trade infrastructure, green technology, finance markets, usage of renewable energy, and resource efficiency standards.

According to Nuta, Habib [115], the stock market in Romania acted differently after COVID-19. The study finds that the market did better eventually than before, and also from others where communication service systems played a pivotal role. The study advises that the purpose is for a better understanding of factors. According to Kumar and Ekka [116], the tourism sector in emerging markets has been largely affected and the change in reality is different than before. The study finds that the tourism industry is almost 10 percent of the global economy. However, the industry is always evolving depending on visitor preferences and behavior. The study advises that joint approaches from stakeholders include building trust that ensures safety concerns.

According to Fan, Lederman [117], debt, calamities, and economic growth are interrelated. The study finds that after calamities, debt might get higher, but the growth rate of the economy gets higher as well. However, debt to GDP ratio remains high in developing countries. Preemptive restructuring of debt is better than after a crisis period comes up. The study advises that policies must be taken on sequential debt restructuring. According to Ased, Sinha [118], globalization has a major impact on economic growth. The study finds that foreign direct investment has a positive impact on RGDP but trade openness hurts RGDP. The reasons can be imports, exchange rate fluctuations, and income inequality. The study suggests increasing FDI through policies such as incentives, streamlined processes, and political stability, and also diversifying exports.

3. Methodology

The article has done a systematic review and quantitative research based on causal-comparative and time-series design. The article identified variables as factors that were most consistently mentioned in the literature and applied that finding to validate the result. The analysis was focused on the consistency of the variables that contributed to GDP in emerging markets before and after COVID-19.

The article collected data from the World Bank database. The inclusion criteria of the study were peer-reviewed articles between the years 2021 to 2024, based on emerging markets of developing nations, reporting economic recovery and growth as outcomes. Exclusion criteria were literature that was not from a validated source, and articles with overlapping or incomplete data. The databases used include Google Scholar, Elsevier, and Wiley Library. The key factors are one dependent variable which is GDP growth and nine independent variables comprising broad money (percentage

of GDP), DCPSB (percentage of GDP), FDI, net inflows (percentage of GDP), manufacturing, value added (percentage of GDP), R&D (percentage of GDP), tax revenue (percentage of GDP), trade (percentage of GDP), trade in services (percentage of GDP), and IUI (percentage of population).

The study follows a quantitative econometric model where various statistical techniques including regression analysis, correlation analysis, time series analysis, and coefficient of variation are applied to explore the relation between the dependent and independent variables. The data of the variables were collected from the year 2008 to 2022, covering before and after the COVID-19 economic dataset and the emerging markets. The eligible emerging markets include Argentina, Bangladesh, Bosnia and Herzegovina, Brazil, Bulgaria, Chile, China, Colombia, Costa Rica, Croatia, Egypt, Arab Rep., Greece, Hungary, India, Indonesia, Iraq, Jordan, Kazakhstan, Kenya, Malaysia, Mexico, Mongolia, North Macedonia, Pakistan, Panama, Peru, Philippines, Poland, Romania, Russian Federation, Serbia, Slovak Republic, South Africa, Thailand, Turkey, Ukraine, United Arab Emirates, Uruguay, Uzbekistan, and Viet Nam [119].

In multiple linear regression analysis, the function identifies the impact of independent variables on dependent variables along with their significance as predictors of GDP growth. Here, y represents the dependent variable and x represents the independent variables which are presented by the following equation: ($Y = \beta_0 + \beta_{1X_1} + \beta_{2X_2} + \dots + {}^{\varepsilon}$). The correlation analysis shows the strength and direction of the relationship among the GDP growth and independent variables and the equation follows:

$$R = \frac{\sum(xi - x)(yi - y)}{\sqrt{\sum(xi - x)2 \sum(yi - y)2}}$$

Correlation of variation shows relative viability and dispersion, providing insights into data consistency. The standard deviation and average of all the available variables were calculated and divided to select the eligible variables. The time series graph shows the changes over time between variables, all the seasonal effects, and other noticeable trends. The software used for data processing, data visualization, and statistical analysis is Excel.

4. Results

GDP growth: Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2015 prices, expressed in U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for the depreciation of fabricated assets or for the depletion and degradation of natural resources [119].

Manufacturing refers to industries belonging to ISIC divisions 15-37. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. The origin of value added is determined by the International Standard Industrial Classification (ISIC), revision 3. Note: For VAB countries, gross value added at factor cost is used as the denominator [119].

Foreign direct investment is the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors and is divided by GDP [119].

Tax revenue refers to compulsory transfers to the central government for public purposes. Certain compulsory transfers such as fines, penalties, and most social security contributions are excluded. Refunds and corrections of erroneously collected tax revenue are treated as negative revenue [119].

Internet users are individuals who have used the Internet (from any location) in the last 3 months. The Internet can be used via a computer, mobile phone, personal digital assistant, games machine, digital TV, etc. [119].

4.1. Regression Analysis

Table 1 Regression analysis of key factors

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.315194085							
R Square	0.099347311							
Adjusted R Square	8.56%							
Standard Error	4.167818652							
Observations	600							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	9	1130.494	125.61049	7.231165	0.00%			
Residual	590	10248.72	17.370712					
Total	599	11379.21						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	3.962839253	0.659625	6.0077143	3.2933E-09	2.667340204	5.2583383	2.66734	5.258338301
Broad Money	0.008015412	0.006627	1.2095786	22.69%	-0.00499921	0.02103	-0.004999	0.021030038
DCPSB	-0.00706528	0.008369	-0.8442427	39.89%	-0.0235015	0.0093709	-0.023501	0.009370941
FDI INFLOW	0.06172549	0.024692	2.4997735	1.27%	0.013229726	0.1102212	0.01323	0.110221248
Manufacturing	0.093480281	0.032438	2.8818293	0.41%	0.029772619	0.1571879	0.029773	0.157187944
R&D	-0.71732024	0.421952	-1.7000028	8.97%	-1.54603171	0.1113912	-1.546032	0.111391232
Tax R	-0.0977629	0.029915	-3.2680301	0.11%	-0.15651562	-0.03901	-0.156516	-0.03901019
Trade	0.006466824	0.005585	1.1577932	24.74%	-0.00450301	0.0174367	-0.004503	0.017436656
T. Service	0.000756611	0.027337	0.0276777	97.79%	-0.05293213	0.0544454	-0.052932	0.054445353
IUI	-0.02426315	0.008126	-2.985852	0.29%	-0.04022263	-0.008304	-0.040223	-0.00830367

The independent variables, see Table 1, that are eligible key structural factors comprise FDI, manufacturing, tax revenue, and IUI as they fulfill the p-value criteria (less than 5.00 percent). The significance level is less than 5.00 percent, which also satisfies the two crucial criteria of the best-fit model. Here, the value of R= 9.93 percent and adjusted R square= 8.56 percent. The significance F is 0.00 percent. However, broad money, DCPSB, R&D, trade, and trade service are ineligible due to their p-value greater than 5.00 percent.

4.2. Correlation

Table 2 Correlation analysis of key factors

	GDP growth	Broad Money	DCPSB	FDI INFLOW	Manufacturing	R&D	Tax R	Trade	T. Service	IUI
GDP growth	1									
Broad Money	0.1007	1								
DCPSB	-0.0133	0.6598	1							
FDI INFLOW	0.0785	0.0134	0.0197	1						
Manufacturing	0.1273	0.4826	0.3600	-0.0361	1					
R&D	-0.1148	0.2957	0.3989	0.0521	0.2467	1				
Tax R	-0.2080	-0.1398	0.0946	0.1172	0.0178	0.2692	1			
Trade	0.0102	0.1144	0.3326	0.2122	0.0543	0.0811	0.1053	1		
T. Service	-0.0660	-0.0910	0.1959	0.1917	-0.0604	0.0874	0.4226	0.5520	1	
IUI	-0.1815	0.0615	0.2543	0.0665	-0.0129	0.2853	0.2715	0.3665	0.1753	1

The correlation, see Table 2, presents the relationship between GDP growth and all nine independent variables. Broad money, trade, FDI, and manufacturing have a positive relationship, whereas DCPSB, R&D, tax revenue, trade in services, and IUI have an inverse relationship. The correlation coefficient of FDI and manufacturing is 3.6. The tax revenue has a positive relationship with FDI inflow. The correlation between internet users in the population and manufacturing is slightly negative by 1.3 percent. Internet users in the population have a positive impact on FDI inflow. This is shown in the correlation of co-efficient by 6.7 percent.

4.3. Coefficient of variation (C.V.)

**Table 3** Coefficient of variation analysis of key factors

Average	3.252749	58.96998	52.06621	3.661055	14.42405	0.495316	13.21081	79.95182	14.63956	52.36441
Standard Deviation	4.358557	38.91859	30.97603	7.152227	6.126247	0.471668	6.983173	41.82829	8.630532	24.5242
C.V	134.00%	66.00%	59.49%	195.36%	42.47%	95.23%	52.86%	52.32%	58.95%	46.83%

Here, see Table 3, manufacturing has the lowest C.V. with a rate of 42.47% and the second lowest is internet users number in the population, which is 46.83%.

4.4. Graphs

The time series graph shows the close lookup between the dependent variable, like GDP growth, and the key findings of the independent variables, Manufacturing, FDI, Tax revenue, and Internet users in the population.
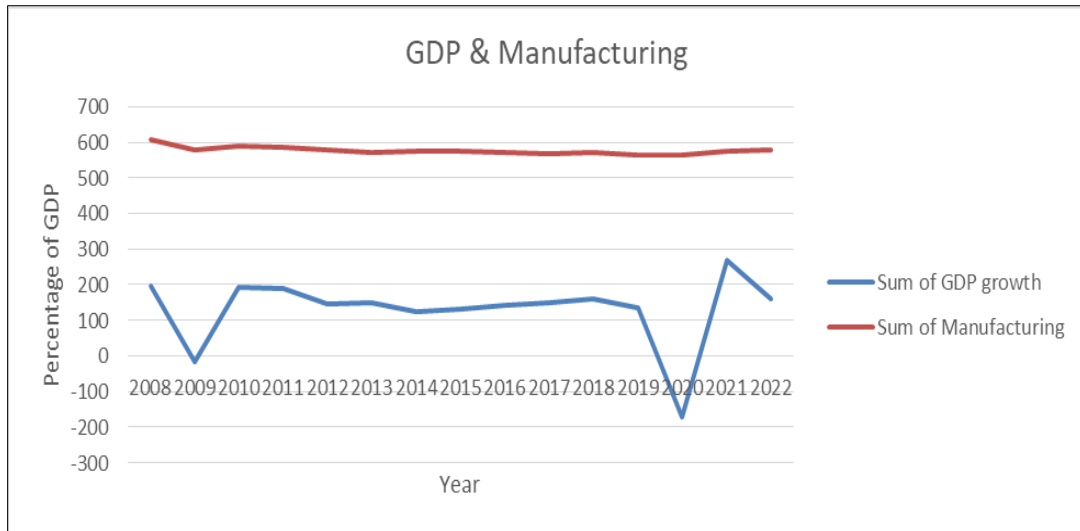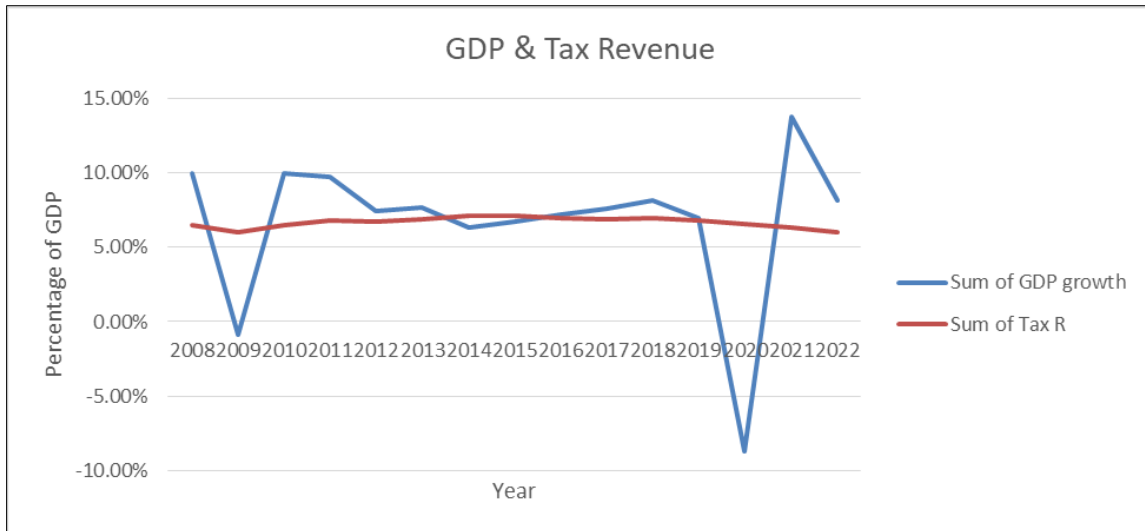
Figure 1 Time series analysis between GDP growth and Manufacturing

The graph of GDP and manufacturing shows, manufacturing maintained a position between 550 to 600 and did not face any recognizable deviation in the whole period. However, GDP growth faced a remarkable decrease in 2020, which was in the negative balance of almost 200, and the second most decrease was in 2009, which touched the null balance. The most recognizable point was in 2021 when GDP growth saw its greatest number in the whole period, which was almost 300.
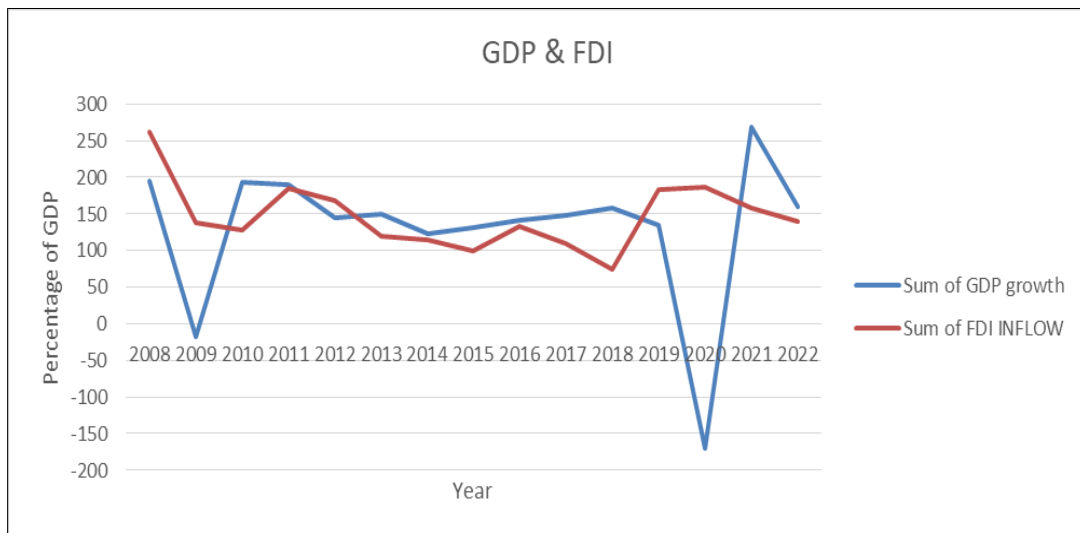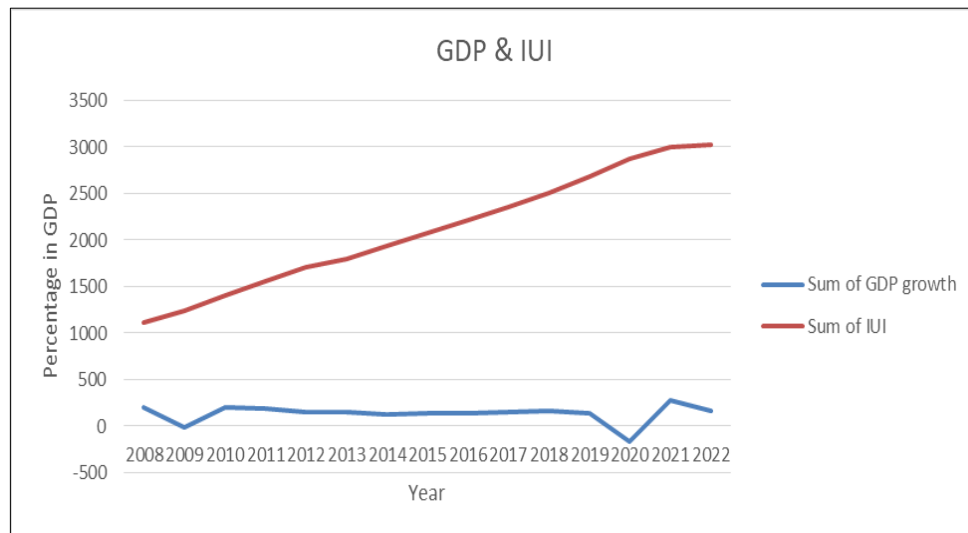

Figure 2 Time series analysis between GDP growth and FDI

The graph of GDP and FDI shows that FDI faced its low point of 75, which was in 2018, and the second lowest point was in 2015 with a point of 100. Unlike manufacturing, in 2019 and 202020 FDI was facing its peak points of more than 150. Followingly, GDP growth faced a remarkable decrease in 2020, which was in the negative balance of almost 200, and the second most decrease was in 2009, which touched the null balance. The most recognizable point was in 2021 when GDP growth saw its greatest number in the whole period, which was almost 300.

Figure 3 Time series analysis between GDP growth and Tax revenue

The graph of GDP and tax revenue shows that tax revenue stayed in the range of 5 to 7 percent in the whole period. Again, GDP growth faced a remarkable decrease in 2020, which is in the negative balance of almost 9 percent, and the second most decrease was in 2009, which touched the null balance. The most recognizable point was in 2021 when GDP growth saw its greatest number in the whole period, which was almost 14 percent.

Figure 4 Time series analysis between GDP growth and IUI

The graph of GDP and IUI shows that IUI has a very consistent rate of increment throughout the whole period, where in 2009 the markup was more than 1000, and initially in 2022 it hit more than 3000. Followingly, GDP growth faced a remarkable decrease in 2020, which was in the negative balance of almost 200, and the second most decrease was in 2009, which touched the null balance. The most recognizable point was in 2021 when GDP growth saw its greatest number in the whole period, which was almost 300.

5. Discussion

The findings show some new follow-ups, such as tax revenue and IUI, have some significant impact on GDP growth similar to the previous common key structural factors, manufacturing and FDI. These factors were stated earlier in literature reviews, and after applying the statistical findings, these variables can be taken as eligible.

In the regression analysis, p-values less than 5.00 percent indicate that the variable is statistically significant and p-values greater than 5.00 percent indicate that these variables do not have a significant relationship with the dependent variable. FDI inflow, Manufacturing, Tax Revenue, and IUI have p-values of 1.27 percent, 0.41 percent, 0.11 percent, and 0.18 percent. This shows they have an applicable relationship with the GDP growth rate.

Here, manufacturing has a positive relationship with the GDP growth rate as an increase of 1 percent in manufacturing makes an increment in the GDP growth rate by 0.09348 percent. Emerging markets are still highly dependent on industrial sources to have employment, cash flow, and growth even before COVID-19. Similarly, FDI has a positive relationship with manufacturing, as a 1 percent increase in FDI inflows affects manufacturing positively by 0.0617 percent. The monetary value of FDI is a reliable source for infrastructural development, joint ventures, funding, and debt. Conversely, tax revenue has a negative relationship with FDI. The increase of 1 percent in tax revenue will negatively impact FDI by 0.0977 percent. FDI is negatively impacted by excessive tax. When the emerging market's government imposes various kinds of taxes on foreign investments, it also discourages foreign investors from investing. Lastly, a 1 percent increase in IUI will negatively impact by 0.0243 percent on manufacturing. An increase in the population using the Internet will affect the manufacturing industry negatively, as people in emerging markets are prone to outsourcing services as analyzed by literature reviews.

The independent variables have a significant correlation as reducing the tax revenue will increase the FDI inflow, which ultimately impacts positively on the GDP growth rate. While high tax burdens may discourage FDI, favorable tax policies can increase it. Increasing the tax revenue by 1 percent will increase the FDI inflow by 11.7 percent because of having a notably weak inverse relationship. As foreign companies establish production facilities to benefit from cheaper costs and access local markets, FDI inflows frequently target the manufacturing sector. The internet has created so many firms to conduct operations virtually, reducing industrialization. Digitalized industries and smart factories are examples of digital technologies that increase manufacturing, but also replace many material industries with internet usage. Due to the trend of digital transformation, nations with high internet penetration tend to attract more foreign investors, a positive relation with FDI.

C.V. shows how manufacturing over the last fifteen years in 40 different emerging markets remains the most consistent factor that played a vital impact in the GDP growth of each country with a minimal C.V. rate of 42.47 percent. Another similar example is the number of internet users in each population over the years, with a C.V. rate of 46.83 percent among all the economies.

In the graph, GDP growth is highly variable from year to year, highly negative in the financial crisis year of 2009 and the COVID-19 year of 2020; although manufacturing remains consistent. This indicates that other sectors or factors may be contributing to the large swings in GDP, rather than manufacturing alone. Moreover, FDI inflows are comparatively consistent but the connection with GDP growth is visible as an increasing trend in years with higher FDI inflow. This raises the possibility of a relationship between economic expansion and foreign investment. This shows manufacturing and FDI do influence GDP growth positively, despite being very weak in proportion. It is noticeable that despite maintaining a relatively stable tax revenue, the GDP growth rate fluctuated highly, showing a very low impact on the tax revenue. IUI has a completely different trend compared to what was happening with the GDP growth rate, which validates the findings in the regression and correlation analysis. It is proven that tax revenue and IUI have a comparatively weak and inverse relation with GDP growth.

The article faces limitations on the basis that some factors having no relation with the dependent variable still were mentioned quite evidently in previous literature and assessment of the sources of data in some analysis. As the article talks about concepts and their effectiveness, therefore, this conceptual knowledge needs to be guided through in-depth factor-oriented research. These findings can help for further investigation as they are very vital for shaping economies in the new era.

6. Conclusion

Throughout this paper, we explored how emerging markets got back to a stable economy after the COVID-19 pandemic, and how varied structural factors shape economies around the world. When the whole world faced a shutdown due to the pandemic and markets came to a standstill, the thought of running economies was not an option as it was challenging to even survive for anyone. Each market experiences various fluctuations in its period. However, the economy always teaches resilience and demonstrates its ability to rise stronger. Some key factors are catalysts in this period to pass such an economic crisis. Some say it is the technology, some say it is the infrastructure, and again some even highlight it is the human conception. The purpose of the paper is to relate those key structural factors as variables and how they contribute to the broader economic outcomes. The variables were specific and were evaluated quantitatively. The most

common factors that researchers mentioned before COVID-19 were manufacturing, services, entrepreneurship, and technology having a huge impact in emerging markets. The study after COVID-19 adds various topics that are quite new, in addition to previous factors, such as green economy, sustainable goal development, micro-management, circular economy, etc. We are looking for the exact answer that can be valued on numbers. Out of the nine structural key factors, some selected factors comprising manufacturing, FDI inflow, tax revenue, and internet user number are in the best-fit model of regression analysis. The correlations and coefficient of variations showed factors that are preferable due to their consistency. The time series analysis also showed a visualization of the validation of our findings.

In conclusion, manufacturing still is a growth maker in emerging economies as most of them depend on industrialization. Emerging markets economies should be invested respectively in manufacturing until their transition to service sectors does make an actual impact on GDP growth, otherwise it can create an economic crisis. Tax income allows the government to expenditure on certain policies and infrastructure, so proper tax revenue should be assured from every source. FDI gives the capacity to have reserve capital in market economies that have benefits such as exchange rates and new ventures. Policy making, including tax implications on FDI, should be flexible as it is a revenue source from foreign investors. Lastly, the internet has profoundly made major changes in today's era, especially its increased involvement in the economy. For economies to be shaped and developed, currently there is a need to adopt digital technologies and apply effective policies.

Further investigation should explore the post-COVID-19 key structural factors in a thorough and detailed analysis of emerging markets. The study's limited database suggests the need for longitudinal research to understand the role of key structural factors in emerging market development and economic success.

Compliance with ethical standards

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Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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Authors' contributions

Conceptualization, Mashfiqul Haque Ariyan.; Methodology, Mashfiqul Haque Ariyan; Software, Azrun Nahar Promity; Formal Analysis, Mashfiqul Haque Ariyan; Writing—original draft preparation, Mashfiqul Haque Ariyan, Writing—review and editing, Mashfiqul Haque Ariyan. All authors have read and agreed to the published version of the manuscript.

Disclosure of conflict of interest

The authors declare that they have no competing interests."

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