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An Analytical Study of Gross Domestic Product Per Capita in United States Dollar for Selected Asian Countries

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Abstract

The world is divided into various countries. These countries have their own policy for economic development. There are various methods for determining economic development out of that one method or one measure is Gross Domestic Product (GDP). Every country has their own GDP which measure the performance of economy. For this study gross domestic product per capita in United States dollar has been analyzed with selected Asian countries based on respective nation's population as on 2021. The study period is considered from 2015 to 2021. For identify difference among per capita GDP of selected nations one way ANOVA tool has been used as statistical parameter. The major finding of the study indicated as China saw increasing trend of per capital GDP for selected time period. India indicated fluctuating trend of per capita GDP for the study period. Out of selected countries Pakistan indicated lowest per capital GDP from selected countries. On an average performance of Indonesia, Philippines and Vietnam in concern with per capita GDP was same during the study period. Japan indicated highest per capital GDP out of selected countries.

Keywords: Domestic, Gross, Performance, Nations

Introduction

The gross domestic product is considered as total value of finished goods and services manufactured by countries within their territorial boundary for the specified time period like year. For the identification of size of economy any nation use GDP as parameter for that. The expenditure method has been mostly used for calculating GDP of any nations. The sum of the domestic product incomes of all nations in the globe is recognized as a world GDP (Silver, 2022). Gross national income is calculated by taking the GDP of a nation, adding the value of income from imports, and deducting the value of income from exports. Because it accounts for the effects of both domestic and foreign commerce, gross national income, or GNI, varies from GDP in terms of value. For the study different nations have been selected based on their population in concern with Asia (Review, 2022).

Literature Review

Baughn et al. (2007) have worked on corporate social and environmental responsibility in Asian countries and other geographical regions. The social and environmental facets of corporate social responsibility are examined in 15 Asian nations for this study. When compared to other areas (Western Europe, East/Central Europe, Australia/New Zealand, US/Canada, Middle East, and Africa), the performance of businesses in these Asian nations on the two categories of CSR is also evaluated according to national economic, political, and social factors. This study shows significant national and regional variances in CSR, drawing on more than 8700 surveys of businesses in 104 countries. Firms are rooted in several national settings, each with its own set of underlying institutional capacities. Strongly shown connections

between CSR and national economic, political, and social settings highlight how crucial it is for a nation to have institutional ability to support and promote CSR activities.

Kitov (2009) has worked on the evolution of real GDP per capita in developed countries. The rate of growth of real GDP per capita is calculated as the product of two factors: a monotonically declining economic trend and variations linked to changes in the population's composition by age group. A real GDP per capita inverse function with a constant numerator is used to predict the economic trend. The yearly increase in GDP per capita for the four greatest economies—the USA, Japan, France, and Italy—is shown to have a very weak linear trend in statistical analysis data from 19 chosen OECD nations during the period between 1950 and 2007. There is a more positive linear trend in yearly increment in the UK, Australia, and Canada. The variations surrounding significant mean improvements have a nearly normal distribution (with Levy tails). In contrast to the studied industrialized economies, developing nations show yearly GDP per capita increases that are far lower. Despite having high relative growth rates, this shows lack of success.

Oleg & Kitov, ((2009) have worked on The evolution of real GDP per capita in developed countries. An inverse function of real GDP per capita with a constant numerator is used to predict the economic trend. The yearly increase in GDP per capita for the four greatest economies—the United States, Japan, France, and Italy—shows a relatively weak linear trend, according to statistical analysis data from 19 chosen OECD nations for the years 1950 to 2007. Greater positive linear trends in yearly increments are visible in the UK, Australia, and Canada. The variations around important mean increments have a distribution that is almost normal (with Levy tails). The yearly GDP per capita increases in developing nations are much lower than those for the examined industrialized economies. This shows a performance decline despite rapid comparative rates of growth

Nguyen et al. (2010) have worked on relationship between food polyamines and gross domestic product in association with longevity in Asian countries. In 35 Asian nations, the association between gross domestic product (GDP) and nutritional profile was examined, with an emphasis on intake of polyamines. The World Health Organization, the International Monetary Fund, and the United Nations' respective databases were used to gather information on the world's food supply, GDP, and health. The main conclusions showed a strong correlation between GDP and the quantity of polyamine per 1000 calories of diet. Both GDP and the ratio of polyamine to food's energy quotient were linked to life duration. Because polyamines have been linked to longer lifespans, it stands to reason that they may play a part in deciding how long humans live.

Cameron Aj (2013) have analyzed macro environmental factors including GDP per capita and physical activity in Europe. There is ample evidence of socioeconomic disparities in physical activity at the individual level. Comparatively little research has been done to determine if differences in macro environment factors, such as industrial prosperity, and physical activity levels between nations. Researchers looked at the relationship between country-level data on macro environment factors, such as gross domestic product (GDP) per capita, public sector health spending, the percentage of people living in cities, and the number of cars per 1000 people, and country-level physical activity prevalence data from earlier pan-European studies. Mature nation GDP per capita and country prevalence of leisure-time physical activity were shown to be strongly and consistently positively correlated (average r = 0.70; all studies, P G 0.05). Two out of three studies found an association between nation GDP per capita and prevalence of adolescent leisure-time physical activity, however neither urbanization nor educational attainment were found.

Hakizimana, (2015) have worked on the relationship between foreign direct investment (FDI) and GDP per capita in Rwanda. A significant source of finance for emerging nations has been

recognized as foreign direct investments. In this aspect, Rwanda has aggressively drawn FDI by fostering and maintaining a very favorable investment climate through significant reforms that make it simpler for enterprises to get established, obtain loans, pay taxes, etc. The package for promoting investment includes, among other things: a regulatory framework, registration facilities and requirements, business changes, closures, disclosure requirements, and other facilities like a working permit, as well as government help of investment opportunities, dispute resolution, fund transfers, special economic zone assistance to help, public-private partnerships, etc. In this study, the link between Rwanda's GDP per capita and foreign direct investment (FDI) attraction was examined. According to the results, there is a substantial positive correlation between FDI inflows and GDP per capita during the 2008–2012 study period, which has a beneficial impact on economic growth.

Pastor et al. (2017) have worked on Higher Education institutions, economic growth and GDP per capita in European Union Countries. This research estimates how much higher education institutions (HEIs) contributed to GDP per capita growth and economic expansion in the European (EU) nations between 2000 and 2015. In order to do this, we examine how universities affect the supply side of their respective national economies, focusing in particular on how HEIs' R&D contributes to the technical capital of the European (EU) nations. To estimate the effects of HEIs using growth accounting methodologies, we presented a methodology of counterfactual scenarios, which assumes a hypothetical circumstance in which HEIs do not exist. According to the findings, these benefits are a substantial driver of growth in European (EU) nations and help to lessen the negative consequences of crisis periods. As per the calculations, the GDP per capita today would be more than 11% more than it would be in the absence of HEIs. Additionally, significant disparities in GDP per capita between European (EU) nations are shown by the data, which are related to HEI activity.

Ilter, (2017) have studied what economic and social factors affect GDP per Capita? A study on 40 Countries. In a sample of 40 nations, this study examines the social and economic variables that influence GDP per capita as a measure of economic progress. Regression analysis is applied to the entire sample, with GDP per capita serving as the dependent variable and the other elements as the independent variables. According to a regression study, the four independent variables that have the most effects on GDP per capita are demographic, GDP, transparency score, and compulsory schooling out of the eleven independent variables.

Elistia & Syahzuni, (2018) have studied on the correlation of the human development index (HDI) towards economic growth (GDP Per Capita) in 10 Asean Member countries. This study looked at the impact of HDI on GDP per capita growth in 10 ASEAN member nations like Indonesia, Singapore, Malaysia, Thailand, Brunei Darussalam, Philippines, Laos, Vietnam, Myanmar, and Cambodia for the study period 2010 to 2016. There is a correlation between the Human Development Index and Gross Domestic Product (GDP) per capita. The findings of this study show that HDI and GDP are strongly and significantly correlated in each nation. It is determined that the HDI level can influence the GDP per capita. Reaching a high degree of human improvement is made feasible by economic progress, which on the one hand increases prospects for economic growth as human development levels rise. The causal link between economic expansion and human welfare shifts to one of reciprocal influence. Therefore, it is evident that the nation's economic human development is influenced by economic growth, as evidenced in per capita income (GDP per capita), which can be a sign of the wellbeing of the nation.

Nolan, (2018) has worked on GDP per capita versus median household income: what gives rise to the divergence over time and how does this vary across OECD Countries? Using information from the OECD National Accounts and the Luxembourg Income this study examines the scope

of that difference and the variables that contribute to it across 27 OECD nations. While most of these nations' median household income has increased faster than their GDP per capita throughout the time period covered by these statistics, the extent of this divergence varies greatly, with the USA standing out as a notable exception. The study separates out a variety of variables that contribute to this difference and reveals that the effects of these variables vary greatly between nations. The magnitudes of that difference as well as the significance of the numerous contributing elements have also changed significantly over time for the majority of the investigated nations. These findings have significant repercussions for tracking and evaluating long-term changes in household earnings and living standards.

Elistia & Syahzuni, (2018) have studied on The correlation of the human development index (HDI) towards economic growth (GDP Per Capita) in 10 Asean Member countries. The connection in the chosen ASEAN nations (Indonesia, Malaysia, Philippines, and Vietnam) between the years 2013 and 2020 is determined by this study. According to the findings, R&D has no substantial influence on LGDP per capita, whereas URB and HC do. Because the countries chosen are developing nations and it would take time for R&D to have an influence on their economic growth, this study's findings are not significant. Even though R&D activities have a negligible impact, they should still be actively encouraged in these nations because they will eventually raise the bar for innovation, as explained by the long-run increasing returns to scale and the endogenous growth theory, demonstrating Romer's theory is valid in Indonesia, Malaysia, the Philippines, and Vietnam.

Munif & Syed, (2020) have worked on role of demographic factors in economic growth of south Asian countries. This study looks at how life expectancy, fertility rates, and the young dependence ratio affect both the long- and short-term economic growth of South Asian nations. The findings indicate that the real stock of capital, fertility rate, and life expectancy are all positively correlated with economic growth, but a rise in the young dependence ratio has a long-term negative impact on economic growth in South Asian nations. Real capital stock and life expectancy have negligible effects on economic growth, according to short-term dynamics, however youthful dependence ratio has a negative and large effect on economic growth in South Asian nations as well as life expectancy's positive and significant effect. In the medium term, there is a one-way causal relationship between young dependence ratio and fertility rate and GDP per capita.

Ding & Asare, (2021) have analyzed Central Bank independence and economic growth per capita growth rates matter? The regression method was used to analyses data from 1996 to 2017 from the World Bank's World Development Indicators, the Global Monitoring Indicators, and the Heritage Foundation's Financial Liberty Index to determine whether Ghana's GDP per capita growth and inflation rates require complete independence from the country's central bank. According to the study, the influence of independence from the central bank is positively correlated with economic growth when the inflation threshold is lower than 26.1 percent at a significance level of 5 percent and an elasticity value of 0.07. Additionally, there is an adverse association between central bank independence, economic growth variability, and inflation variability. Politicians have a duty to continuously maintain, defend, and guarantee the implementation of central bank independence throughout time.

Research Gap

The Gap between previous study and current study is considered as research gap. For the study Hakizimana, (2015) have worked on The relationship between foreign direct investment (FDI) and GDP per capita in Rwanda. (Elistia & Syahzuni, (2018) have studied on The correlation of the human development index (HDI) towards economic growth (GDP Per Capita) in 10 Asean Member countries Nolan, (2018) has worked on GDP per capita versus median household

income: what gives rise to the divergence over time and how does this vary across OECD Countries? These are the study have been made on different aspect related with GDP but not a single study has been made on gross domestic product per capita in concern with United State so, there is research gap for further study

Methods

The following research methodology has been used for the problem of gross domestic product per capita in US dollar in Selected Asian countries.

Objectives of the study; (1) To Know per Gross domestic product per capita in selected Asian Countries; (2) To Compare GDP per capital among Selected Asian Countries.

Hypotheses for the study: H0 = There is no significant difference in Gross domestic product per capital in US dollar among selected Asian Countries during the study period.

Period of the study: The period of the study has been considered from 2015 to 2021.

Scope of the study: the scope of the study has been divided into two part fist one is functional scope which indicated functional aspect of the study and second one is geographical scope which indicates area cover by the study.

Functional Scope: Functional scope of the study indicate per capita gross domestic product of selected countries.

Geographical Scope: For geographical scope selected nations like China, Indian, Indonesia, Pakistan, Bangladesh, Japan, Philippines and Vietnam have been considered.

Selection of Samples: For any study selection of samples are crucial task. The following samples have been selected to generalize problem during the study period. The population of 2021 is considered as base for the selection of samples and non-probability sampling technique has been used for selection process.

Sr. No.	Counties	Population 2021	Sr. No.	Counties	Population 2021
1	China	1,444,216,102	5	Bangladesh	166,303,494
2	India	1,393,409,033	6	Japan	126,050,796
3	Indonesia	276,361,788	7	Philippines	111,046,910
4	Pakistan	225,199,929	8	Viet Nam	98,168,829

Source: https://statisticstimes.com/demographics/asian-countries-by-population.php

Data Collection

The source of data for the study is secondary in nature. The data have been collected through different websites, journal and magazine. The reliability of data is depends on selected source.

Results and Discussion

Data Analysis and Interpretation

Per Capita Income in US dollar

Years	China	India	Indonesia	Pakistan	Bangladesh	Japan	Philippines	Vietnam
2015	8016.43	1605.61	3331.70	1356.67	1248.45	34960.64	3001.04	2581.62
2016	8094.36	1732.55	3562.82	1540.18	1678.95	39375.47	3073.65	2745.57
2017	8816.99	1980.67	3837.58	1631.53	1839.58	38834.05	3123.25	2974.12
2018	9905.34	1998.26	3893.86	1678.04	1991.48	39727.12	3252.11	3230.93
2019	10143.84	2072.24	4135.23	1481.81	2154.23	40458.00	3485.34	3425.09
2020	10408.67	1933.10	3870.56	1359.51	2270.35	39918.17	3301.22	3526.27

2021	12556.33	2277.43	4291.81	1537.94	2503.04	39285.16	3548.83	3694.02
Avg.	9705.99	1942.84	3846.22	1512.24	1955.16	38936.94	3255.06	3168.23
Max.	12556.33	2277.43	4291.81	1678.04	2503.04	40458.00	3548.83	3694.02
Mini.	8016.43	1605.61	3331.70	1356.67	1248.45	34960.64	3001.04	2581.62

Source: *https://databank.worldbank.org/indicator/NY.GDP.MKTP.CD/1ff4a498/Popular-Indicators#*

Above table indicated per capital Gross domestic product of in United Dollar for selected nations for the study period of 2015 to 2021. In the year 2015 per capita GDP indicated 8016.43 dollar in China. It was increased in the year 2016 is 8094.36 dollar. Where was minor increase in per capita GDP between 2015 and 2016 but in the year 2017 per capita GDP whose increased up to 8816.99 dollar which was around net increase of 750 dollar during the year. In the year 2018 per capita GDP indicated as 9905.34 Dollars. Between 2017 and 2018 the net increase of 1088.35 of per capita GDP has been realized. In the year 2019 Per capita GDP was 10143.8 dollar which increased by 264.83 in the year 2020 and stood at 10408.7 dollar. There was drastic change has been identified in the year 2021 as net increase in per capita GDP was 2147.66 dollar which was highest increase out of selected nations. For six years of time period on an average 9705.99 dollar per capita GDP has identified for China. For Indian economy per capita GDP indicated as 1605.61 dollar in the year 2015. For the year 2016 Per capita GDP was 1732.55 dollar which was increased by 126.94 dollar as compare to previous year. In the year 2017 per capita GDP was 1980.67 which increased as compared to previous year by 248.12 dollar. It was highest increase during the study period. In the year 2018 there was just only 17.59 dollar increment in per capita GDP and total per capita GDP was 1998.26 dollar.

For the year 2019 per capita GDP was 2072.24 dollar which was increased by 73.98 dollar as compared to previous year but in the year 2020 there per capita GDP was decreased by 139.14 dollar and stood at 1933.1 dollar which was higher decrement during the study period. For the year 2021 per capita GDP was increased by 344.33 dollar and took the position of 2277.43 dollar per capita GDP. On an average India's per capita GDP position was 1942.84 dollar has been identified during study period. In case of Indonesia for the year 2015 the position of per capita GDP was 3331.7 dollar which was increased by 231.12 dollar in next year and stood at 3562.82 dollar in 2016 further in the year 2017 per capita GDP was increased by 274.76 dollar which was highest increment during study period and total per capita GDP was 3837.58 dollar. For the year 2018 per capita GDP was just 3893.86 which include increment of 56.28 dollar as compare to previous year. For the year 2019 per capita GDP was 4135.23 which was second highest during the study period but in next year 2020 per capita GDP was decreased by 264.67 and the position of 3870.56 dollar. Which was higher decreased during the study period. It may happen due to covid-19. For the year 2021 the per capita GDP was 4291.81 which were highest during the study period net increase of 421.25 dollar as compare to previous year. In case of Pakistan the for the year 2015 per capita GDP was 1356.67 dollar which was increased in the year 2016 by183.51 dollar. For the year 2017 per capita GDP was 1631.53 which obtained by 91.35 dollar increment as compare to next year for the year 2018 per capita GDP was 1678.04 which includes increment of previous year as 46.51 dollar. For the year 2019 per capita GDP was 1481.81 dollar.

As compared to previous year it was decreased by 196.23 dollar. For the year 2020 per capita GDP was 1359 dollar which also further decreased by 122 dollar as compare to previous year. There was minor increase in per capita GDP as 178.43 dollar and it was stood at 1537.94 dollar. On an average 1512.24 dollar per capita GDP was identified by the study. Bangladesh indicated per capita GDP in the year 2015 as 1248.40 which was increased in the next year by 430.5 and stood at 1678.95 dollar. For the year for 2017 Per capita GDP was 1839.58. in that year around

160.63 dollar has been increased. In the year 2018, 151.9 dollar increased and per capita GDP was 1991.48 dollar identified. In the year 2019 and 2020 per capita GDP was 2154.23 and 2270.35 dollar which indicated gross increase in per capita GDP. For the year 2021 per capita GDP was 2503.04 dollar which was highest during the study period. As compared to previous year 232.69 dollar increment has been identified. In Bangladesh on an average 1955.16 dollar per capita GDP was recorded. In the case Japan per capita GDP in the year 2015 recorded is 34960.64. for the year 2016 it was increased by 4414.83 dollar and stood at 39375.47 dollar but in next year there was decrease in per capita GDP by 541.42 dollar and reached at 38834.05 dollar. For the year 2018 and 2019 per capita GDP were 39727.12 and 40458 respectively. There was decrement for the year 2020 and 2021 as 39918.17 and 39285.16 respectively in which as compare to 2020 year 633.01 dollar decrease in per capita GDP. On an average Japan indicated highest per capita GDP as 38936.94 dollar as compare to other selected nations. Philippine indicated per capita GDP as 3001.04 dollar in the year 2015. For the year 2016 and 2017 minor increment has been identified as 3073.65 dollar to 3123.25 dollar. For the year 2018 and 2019 per capita GDP was 3252.11 and 3485.34 dollar which also increase by 233.23 dollar as compared to previous year but in the year 2020 GDP was decreased by 184.12 dollar because it may affect covid-19 crises. For the year 2021 GDP was recorded as 3548.83 dollar in which net increase of 247.61 dollar has also recorded for previous year. On an average per capita GDP of Philippines indicated as 3255.06 dollar. For the study period Vietnam indicated increasing trend for per capita GDP. For the year 2015 and 2016 per capita GDP was 2581.62 dollar and 2745.57 dollar respectively. The net Increase has been identified as 163.95 dollar. For the year 2017 and 2018 per capita GDP was recorded as 2974.12 and 3230.93 in which 256.81 dollar has been increased as compare to previous year. For the year 2019 to 2021 per capita GDP was 3425.09, 3526.27 and 3694.02 dollar respectively. On an average 3168.23 dollar per capita GDP has been recorded for Vietnam.

Hypothesis Testing

Groups	Count	Sum	Average	Variance
China	7	67941.96	9705.994	2515323
India	7	13599.86	1942.837	48539.69
Indonesia	7	26923.56	3846.223	105010
Pakistan	7	10585.68	1512.24	15269.22
Bangladesh	7	13686.08	1955.154	171592.5
Japan	7	272558.6	38936.94	3339322
Philippines	7	22785.44	3255.063	42713.13
Vietnam	7	22177.62	3168.231	172497.9

Source: Calculated from MS Excel

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	7.97E+09	7	1.14E+09	1420.754	2.27E-53	2.207436
Within Groups	38461605	48	801283.4			
Total	8.01E+09	55				

Source: Calculated from MS Excel

Above table indicated one way Anova for hypothesis testing. This test has been performed at 5% level of significance. The result of the test indicted as p-value is less than 0.05 which means there is significance difference in Gross domestic product per capital in US dollar among selected Asian Countries during the study period. it was also identified with calculated and critical value. For the test calculated value is 1420.75 and critical value is 2.20 which is far more than that. It is also indicated null hypothesis has been rejected.

China indicated per capita GDP as increasing trend during the study period. in the year 2015 per capital GDP was 8016.43 dollar which was increased in the year 2021 as 12556.33 dollar. Continuous increment has been found in China for per capital GDP.

For India there was fluctuating trend has been identified. In the year 2015 per capital GDP was 1605.61 dollar has been recorded after that it was increase up to 2072.24 dollar in the year 2019 but in next year it was decreased and further increase as 2277.43 dollar in the year 2021.

The condition of Indonesia was fat batter than India because average per capital GDP of India was 1942.84 dollar has been recorded but for Indonesia it was 3846.22 dollar which good sign for economic development.

Out of selected countries the poor performance in per capita GDP has been identified in Pakistan because lowest average per capita GDP as 1512.24 dollar has been recorded. It also indicated fluctuating trend during the study period.

As per average per capital GDP The condition of India and Bangladesh was same because both country have on an average per capita GDP as 1942.84 and 1955.16 dollar respectively.

Japan indicated highest per capita GDP during the study period. on an average 38936.94 dollar per capita GDP has been recorded. In the year 2020 there was decrease in per capita GDP it may be due to covid-19 pandemic.

The condition of Philippines and Vietnam were slickly same as compare to other selected nations. On an average Philippines indicated 3255.06 dollar and Vietnam indicated 3168.23 dollar as per capita GDP during the study period.

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