Singapore Economy Analysis

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5/7/2023

1. Introduction

Singapore's economy has a significant growth and development from 2001 to 2020. During this 20-years period, Singapore has become one of the most prosperous economies around the world, driven by its strong and well-diversified economy, open trade policies, and strategic location. And its outstanding performance has attracted significant foreign investment.

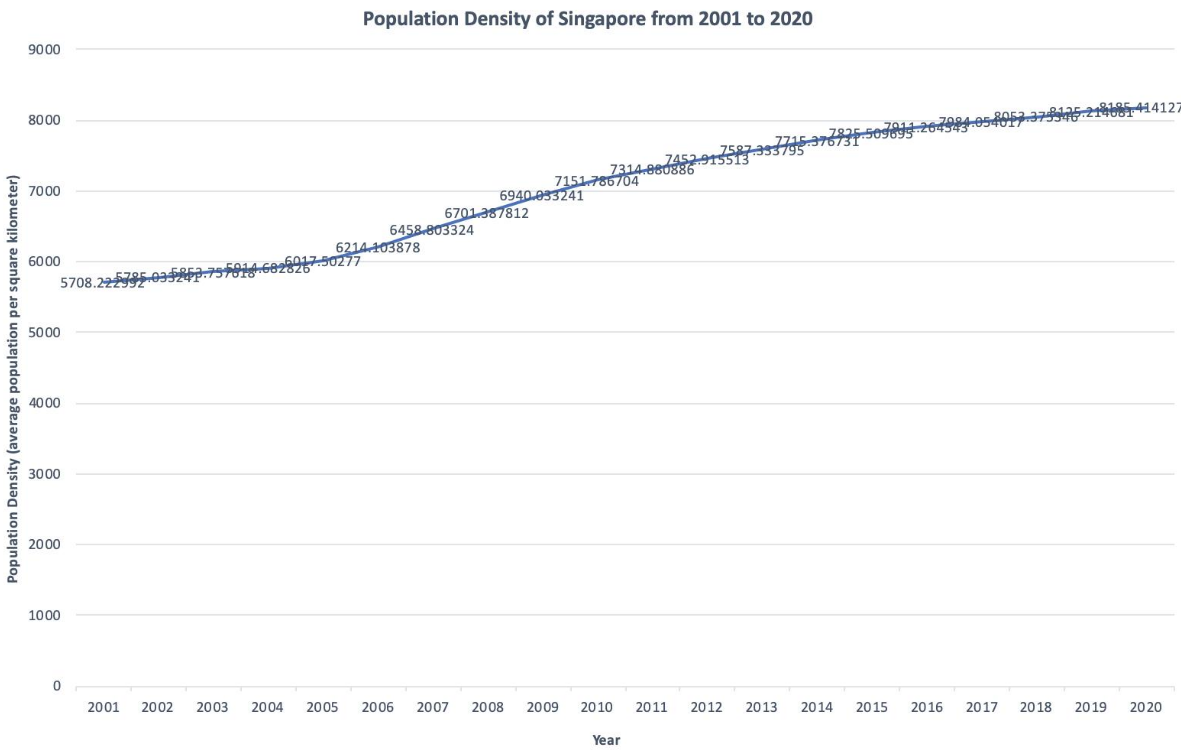
In addition, Singapore's strong manufacturing and services sectors of its economy are also pretty important parts, which have been supported by the government's policies and investments in education and infrastructure. Singapore has also focused on developing its service sector, including financial services, tourism, and healthcare, positioning Singapore as a global financial center. So Singapore's economy has shown impressive growth and development over the past two decades. And there are 10 variables that can help to analyze and understand more specific details about Singapore's economy development over the past 20 years.

2. Variables Analysis

- **Variable 1:**

Population Density (average population per square kilometer)

Year	Population Density (average population per square kilometer)
2001	5708.222992
2002	5785.033241
2003	5853.757618
2004	5914.682826
2005	6017.50277
2006	6214.103878
2007	6458.803324
2008	6701.387812
2009	6940.033241
2010	7151.786704
2011	7314.880886
2012	7452.915513
2013	7587.333795
2014	7715.376731
2015	7825.509695
2016	7911.264543
2017	7984.054017
2018	8053.375346
2019	8125.214681
2020	8185.414127



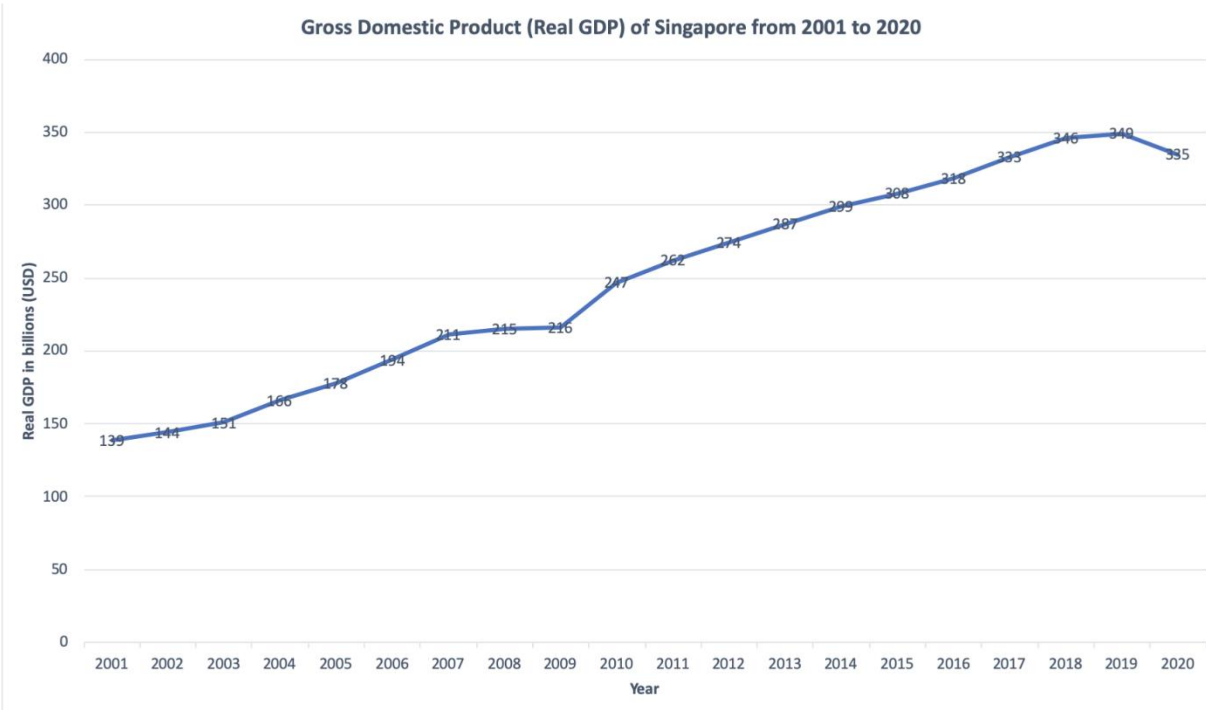
Population density is a measure of the number of people residing in a given area relative to the size of the area, and it is commonly expressed as the average number of people per unit of land area, such as square kilometers or square miles. It provides more specific information about the concentration of people within a given geographic space and deeper understanding of how crowded or sparsely populated an area is. It can also be used to compare population densities between different regions.

The population density of Singapore from 2001 to 2020 shows a steady increasing trend, and there is no any sudden drop or jump here. This continuous increase could be attributed to several factors. Firstly, as one of the main global economic centers, Singapore implemented policies to attract more businesses into the market, leading to lots of job opportunities. Under such circumstance, many foreign talents and immigration were attracted to support economic development. This led to an increased demand for housing and resulted in a growing population, contributing to the overall population density, especially for a small island city-state with a limited land area. Secondly, Singapore has undergone rapid urbanization and development over the years. The government has also implemented comprehensive urban planning strategies to optimize land use. So, for example, the construction of residential and commercial buildings, infrastructure, and public amenities in limited space could contribute to the increasing population density of Singapore during these 20 years.

- **Variable 2:**

Gross domestic product (Real GDP)

Year	Gross domestic product in billions (Real GDP) (USD)
2001	139
2002	144
2003	151
2004	166
2005	178
2006	194
2007	211
2008	215
2009	216
2010	247
2011	262
2012	274
2013	287
2014	299
2015	308
2016	318
2017	333
2018	346
2019	349
2020	335



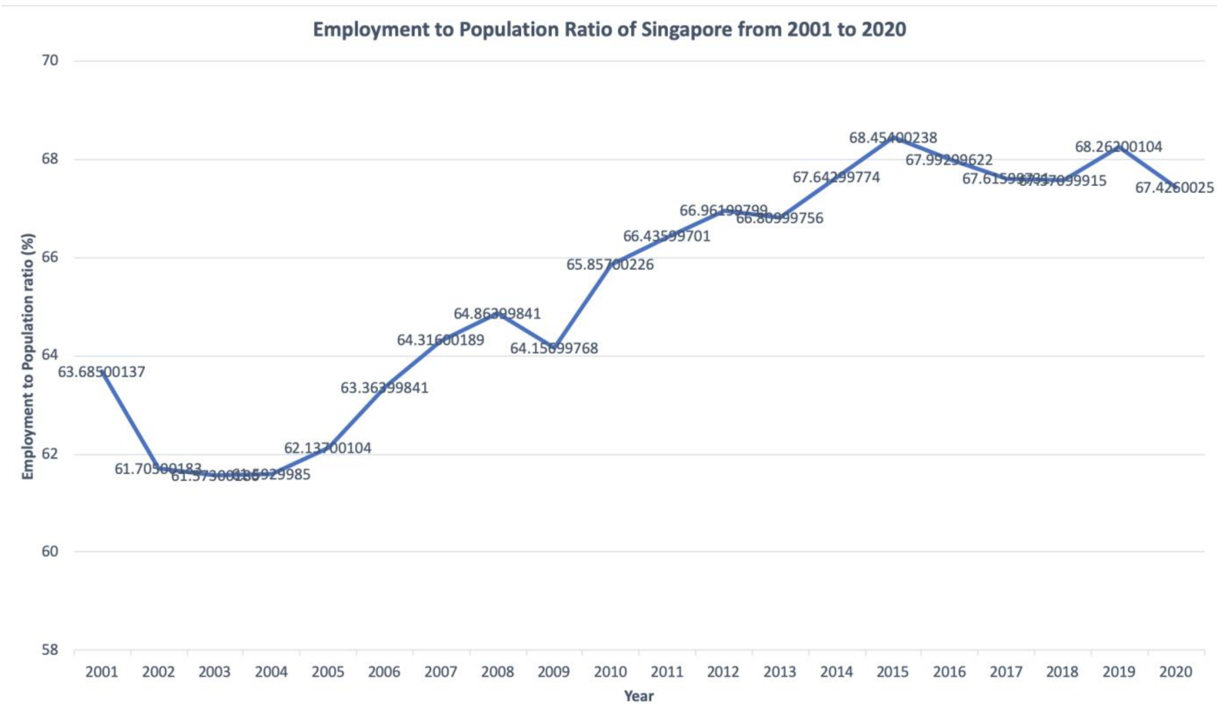
Gross domestic product (real GDP) is a measure of the total value of all final goods and services produced within an economy during a specific period, taking into account inflation or changes in price levels over time. It provides a more accurate representation of the economy's growth or contraction in real terms. Since the influence of price changes are eliminated, real GDP allows for the comparison of economic performance across different periods and helps identify changes in actual production levels.

Before 2020, the overall trend of real GDP of Singapore from 2001 to 2019 shows a continuously increasing trend year by year, except for a relatively stagnant growth from 2008 to 2009 and the later sharp increase from 2009 to 2010. During these 20 years, Singapore has experienced significant economic growth and development, driven by various factors such as strategic location, favorable business environment, strong infrastructure, and government policies that promote trade and investment. But Singapore's economy also faced various challenges and fluctuations due to global economic conditions, including the impact of the 2008 financial crisis, which led to the stagnant growth of real GDP from 2008 to 2009. And the later sharp increase from 2009 to 2010 could be attributed to a period of global economic recovery following the 2008 financial crisis. As global demand rebounded, Singapore, as a major player in international trade, benefited from increased exports and trade activity. In 2020, there is a decrease of real GDP in Singapore. This is the consequence of the impact of COVID-19 pandemic on the global economy.

- **Variable 3:**

Employment-to-Population Ratio

Year	Employment to Population Ratio (%)
2001	63.68500137
2002	61.70500183
2003	61.57300186
2004	61.5929985
2005	62.13700104
2006	63.36399841
2007	64.31600189
2008	64.86399841
2009	64.15699768
2010	65.85700226
2011	66.43599701
2012	66.96199799
2013	66.80999756
2014	67.64299774
2015	68.45400238
2016	67.99299622
2017	67.61599731
2018	67.57099915
2019	68.26200104
2020	67.4260025



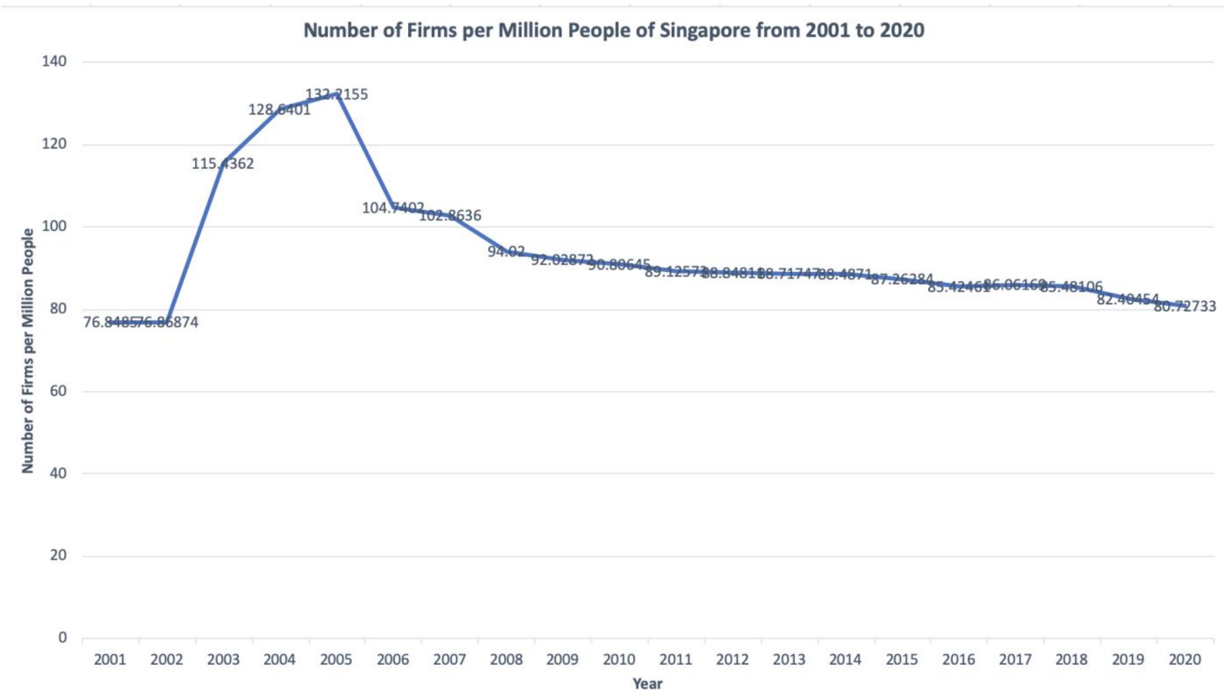
The employment-to-population ratio is a labor market indicator that measures the proportion of working-age population that is employed. It indicates the level of labor market participation and the extent to which a population is engaged in productive employment. So a high employment-to-population ratio typically signifies a larger portion of the working-age population actively participating in the labor force, which is generally seen as positive as it indicates a higher level of economic productivity and lower unemployment.

The graph of the employment-to-population ratio of Singapore from 2001 to 2020 shows overall relatively increasing trend with some fluctuations due to economic cycles and other factors. The high employment-to-population ratio in Singapore during these 20 years is typically due to the country's focus on economic development and job creation, as well as its relatively small population and strong government policies to promote employment. In addition, Singapore has a highly educated and skilled workforce, and the government has implemented various programs to support job training, education, and entrepreneurship, which have also helped to maintain a high level of employment over time. However, from 2002 to 2004, due to the slower growth in the United States and the SARS outbreak in 2003, Singapore's economy had slipped into recession. The global financial crisis in 2008 and the COVID-19 pandemic in 2020 also have had a significant impact on employment rates in Singapore. So during these periods, Singapore's employment-to-population ratio dropped significantly, but then all recovered successfully.

- **Variable 4:**

Number of Firms per Million People

Year	Number of Firms per Million People
2001	76.8485
2002	76.86874
2003	115.4362
2004	128.6401
2005	132.2155
2006	104.7402
2007	102.8636
2008	94.02
2009	92.02872
2010	90.80645
2011	89.12573
2012	88.84811
2013	88.71747
2014	88.4871
2015	87.26284
2016	85.42461
2017	86.06169
2018	85.48106
2019	82.40454
2020	80.72733



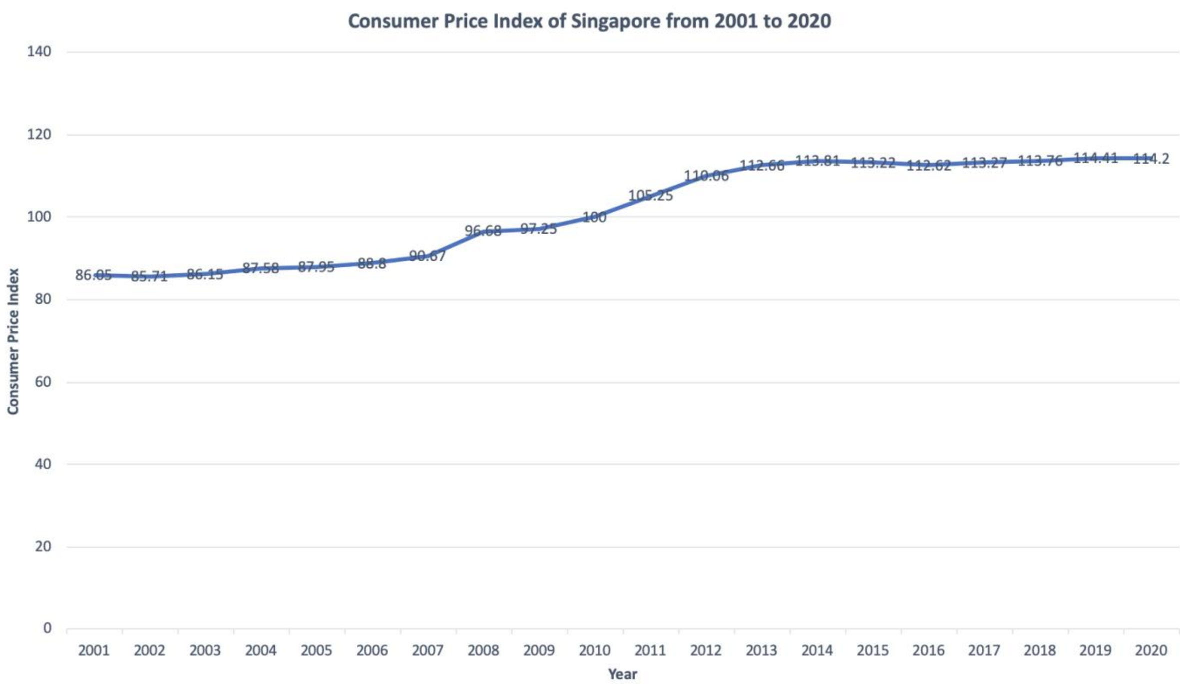
The number of firms per million people is a measure that indicates the density or concentration of firms within a population. It represents the number of registered businesses or firms within a specific area per one million individuals in the population. It provides a relative understanding of the business density or entrepreneurial activity within a population, allowing for comparisons between regions with different population sizes. It can also indicate the level of business activity, entrepreneurship, and economic development among the area.

From the graph of number of firms per million people of Singapore from 2001 to 2020, there is a huge increase after 2002, and then remaining relatively stable from 2006. The huge increase could be attributed to several factors. The most important was the business-friendly environment in Singapore. Singapore has established a reputation for being a business-friendly and supportive economy environment. The government has implemented policies to attract investments, facilitate company incorporation, and reduce bureaucratic processes. These measures have made it easier for entrepreneurs and businesses to start and operate companies in Singapore, leading to an increase in the number of firms. Besides, Singapore has offered attractive regulatory frameworks and tax incentives to businesses, creating a favorable business environment, including low corporate tax rates and various grants and incentives for industries and startups. These policies have encouraged local and foreign businesses to establish and expand their operations in Singapore so that increasing the number of firms.

- **Variable 5:**

The Consumer Price Index

Year	Consumer Price Index
2001	86.05
2002	85.71
2003	86.15
2004	87.58
2005	87.95
2006	88.8
2007	90.67
2008	96.68
2009	97.25
2010	100
2011	105.25
2012	110.06
2013	112.66
2014	113.81
2015	113.22
2016	112.62
2017	113.27
2018	113.76
2019	114.41
2020	114.2



The consumer price index (CPI) is used to track changes in the average prices of a basket of goods and services commonly consumed by households, such as food, housing, transportation, healthcare, education, and other goods and services. It is a widely used indicator of inflation and reflects the price movements experienced by consumers over time. It allows for comparisons of price levels and inflation rates across different time periods.

The graph of the consumer price index of Singapore from 2001 to 2020 shows a overall stable increasing trend, with relatively rapid growth from 2007 to 2013, especially between 2007 and 2008. During these increasing periods, Singapore experienced significant economic growth. So the strong demand, especially in sectors like housing and services, could contribute to higher prices and higher CPI. And in 2008, the global economy experienced a significant increase in commodity prices, particularly oil and food prices. Singapore, as an open economy heavily reliant on imports, was affected by these rising global prices. So the higher costs for imported goods and raw materials could also contribute to inflationary pressures and drive up the CPI. The increase in the consumer price index typically indicates an increase in inflation, resulting in a decrease in the purchasing power of money, which means that the cost of living is rising. So moderate and stable inflation is generally considered desirable as it indicates a healthy level of economic growth, but persistently high and accelerating inflation is not good for the whole economic development.

- **Variable 6:**

Foreign Direct Investment

Year	Foreign Direct Investment in billions (USD)
2001	17.00681886
2002	6.157194144
2003	17.05142015
2004	24.39025497
2005	19.31605881
2006	39.12933205
2007	47.33794778
2008	13.59829854
2009	23.43606406
2010	55.32243416
2011	49.15565732
2012	55.31080755
2013	64.3895149
2014	68.69847283
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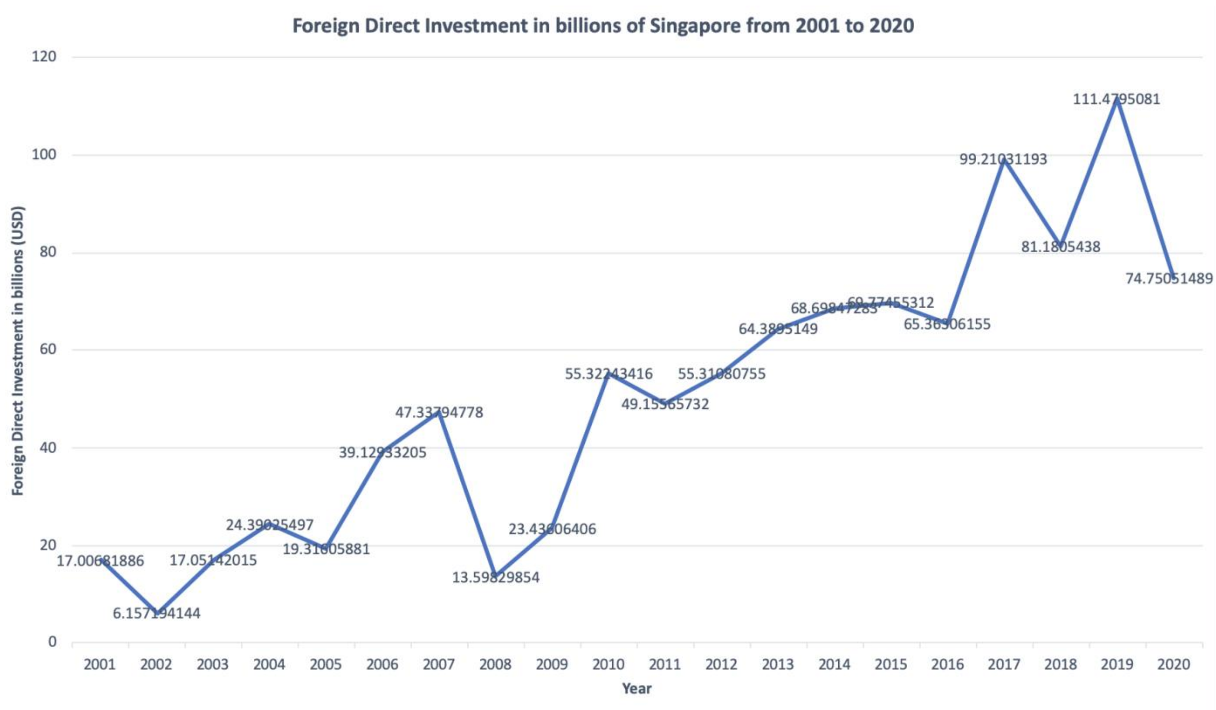
2018	81.1805438
2019	111.4795081
2020	74.75051489



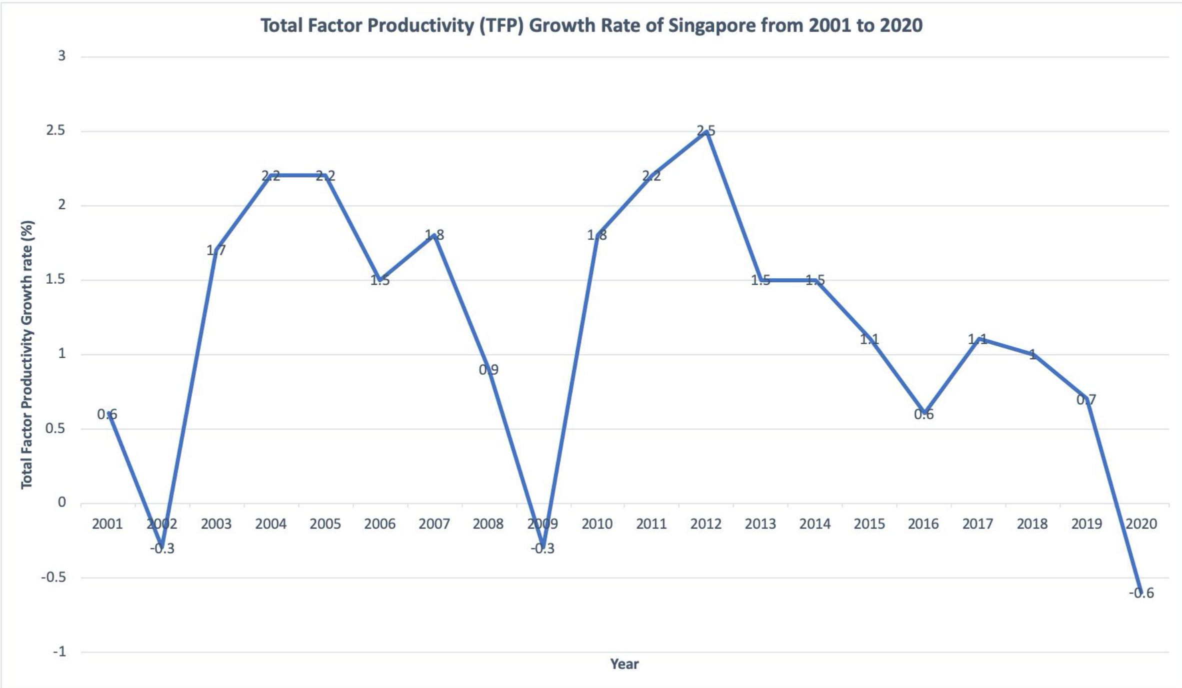
Foreign direct investment refers to the investment made by an individual, business, or entity from other countries. It mainly indicates the establishment of a long-term interest and significant influence by the foreign investor in the economy of the country, such as the establishment of new subsidiaries, the acquisition of existing businesses, or the formation of cooperation with local companies. And it not only includes the financial investments, but also the transfer of capital, technology, knowledge, management skills, and so on.

The graph of foreign direct investment of Singapore from 2001 to 2020 shows an increasing trend with some fluctuations. It is worth noting that there are also two significant drops of foreign direct investment in 2008 and 2020. Obviously, the year 2008 was marked by the global financial crisis, which had a significant impact on the global economy. The crisis led to a high level of economic uncertainty and a decrease in investor confidence, making it more challenging for businesses and investors to access funding for investments. And a sharp decline in international trade and investment flows also happened. So the uncertainty about future economic conditions and the influence of global trade could lead to a decline in foreign direct investment in Singapore. In 2020, due to the COVID-19 pandemic, the lockdowns, travel restrictions, and disruptions to supply chains around the world significantly affected business operations. And travel restrictions also made it difficult for investors to conduct site visits and engage in face-to-face negotiations. These challenges hindered the progress of investment projects and reduced the foreign direct investment of Singapore at that time.

- **Variable 7:**

Total Factor Productivity (TFP)

Year	Total Factor Productivity (TFP) growth rate (%)
2001	0.6
2002	-0.3
2003	1.7
2004	2.2
2005	2.2
2006	1.5
2007	1.8
2008	0.9
2009	-0.3
2010	1.8
2011	2.2
2012	2.5
2013	1.5
2014	1.5
2015	1.1
2016	0.6
2017	1.1
2018	1
2019	0.7
2020	-0.6



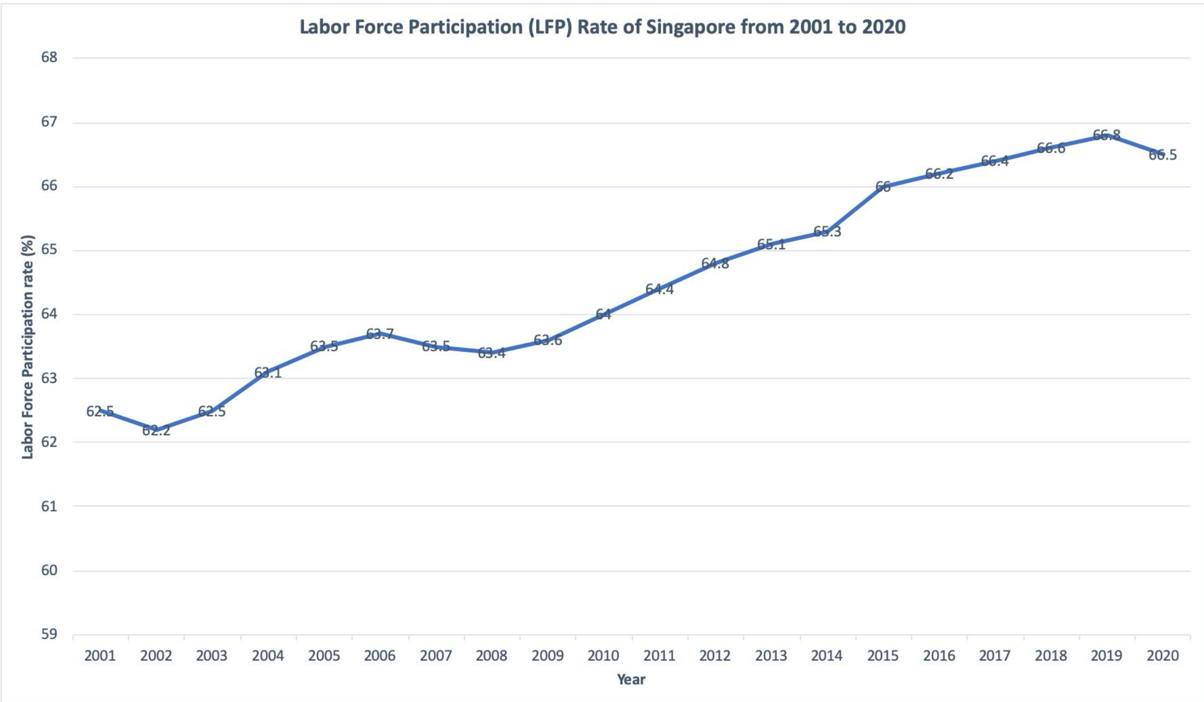
Total factor productivity (TFP) is a measure of the efficiency and effectiveness with which inputs, such as labor and capital, are transformed into output in an economy. The increase of TFP are important for long-term economic growth, because they indicate improvements in the efficiency and effectiveness of resource utilization. Policies and investments that promote innovation, education, and new technologies can contribute to enhancing TFP and overall economic performance.

In the graph of the trend of TFP growth rates in Singapore from 2001 to 2020, there are three negative growth rates in 2002, 2009, and 2020. And except for these three negative growth rates, all others are around 1.5 percent. These three negative growth rates could be cause by some factors. In 2002, Singapore's negative TFP growth rate could have been influenced by factors such as the aftermath of the September 11th terrorist attacks event, which had a great impact on global economic growth and investment. In 2009, the negative TFP growth rate was likely due to the impact of the global financial crisis, which led to a sharp contraction in trade and investment, and also a decline in demand for Singapore's exports. And in 2020, the reason could be the impact of the COVID-19 pandemic by the significant disruptions in global supply chains and trade, and the decline in economic activity and investment. In addition to the negative growth rates, the other years of positive TFP growth rates have likely contributed to the rapid urbanization and economic development in Singapore, and have been driven in part by a focus on productivity and innovation.

- **Variable 8:**

Labor Force Participation Rate (LFP)

Year	Labor Force Participation rate (%)
2001	62.5
2002	62.2
2003	62.5
2004	63.1
2005	63.5
2006	63.7
2007	63.5
2008	63.4
2009	63.6
2010	64
2011	64.4
2012	64.8
2013	65.1
2014	65.3
2015	66
2016	66.2
2017	66.4
2018	66.6
2019	66.8
2020	66.5



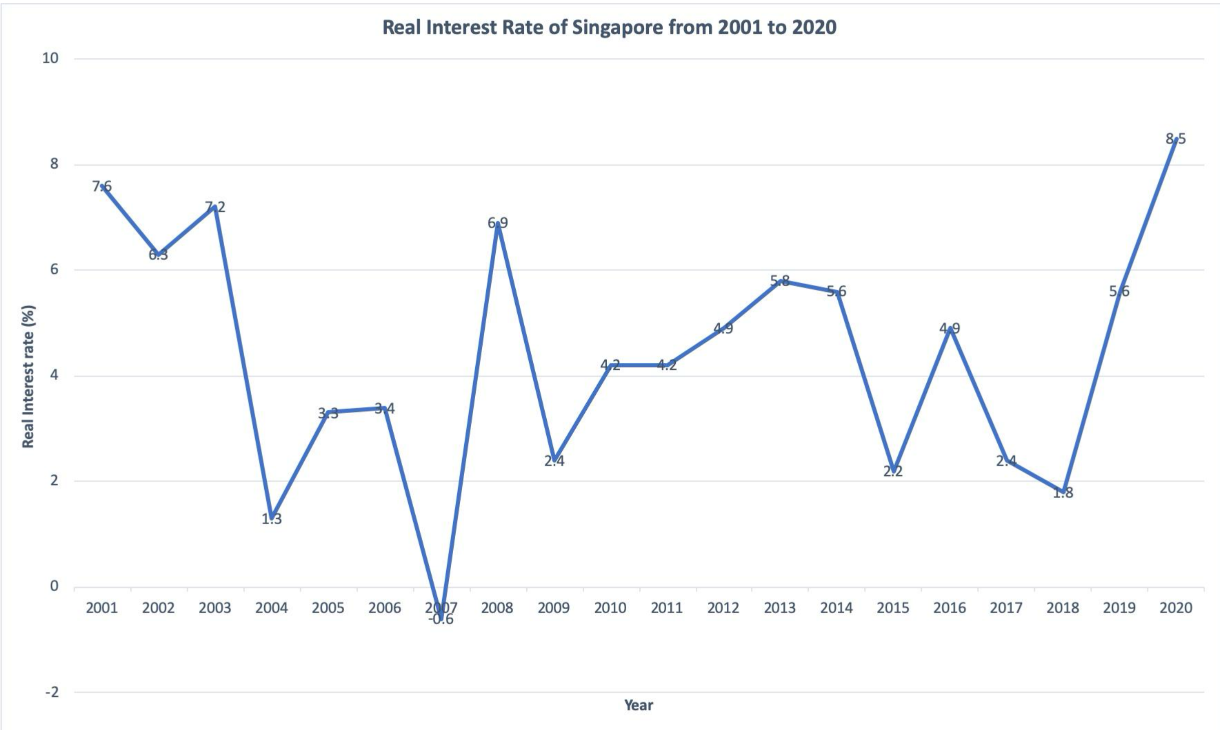
Labor force participation rate (LFP) refers to the percentage of the working-age population who are either employed or actively seeking employment. It is a measure of the proportion of the population that is economically active and willing to participate in the labor market. It shows the degree of utilization of a country's labor potential and can indicate the level of economic activity and labor market situation. A higher labor force participation rate suggests a larger share of the population is engaged in work or actively seeking employment, which can contribute to economic growth and productivity.

By the graph, from 2001 to 2020, the labor force participation rate increased year by year for most periods, except the decreases of LFP rate around 2002, 2008, and 2020. The slightly drop in 2002 could be influenced by the global economic recession after the September 11th terrorist attacks event. At that time, Singapore experienced an economic slowdown, which led to reduced hiring activity and employment opportunities, discouraging individuals from actively seeking employment and contributing to a decline in labor force participation rate. For several years before and after 2008, the global financial crisis was the main reason for the decline of LFP rate during this period, since it would cause the decline in job opportunities and increased layoffs. In 2020, the COVID-19 pandemic resulted in widespread disruptions to economic activities globally, including Singapore. So as more business closures, reduced working hours, and job losses, more individuals chose to exit or temporarily withdraw from the labor force. Therefore, these global factors of economy have affected Singapore's market significantly.

- **Variable 9:**

Real Interest Rate

Year	Real Interest Rate (%)
2001	7.6
2002	6.3
2003	7.2
2004	1.3
2005	3.3
2006	3.4
2007	-0.6
2008	6.9
2009	2.4
2010	4.2
2011	4.2
2012	4.9
2013	5.8
2014	5.6
2015	2.2
2016	4.9
2017	2.4
2018	1.8
2019	5.6
2020	8.5



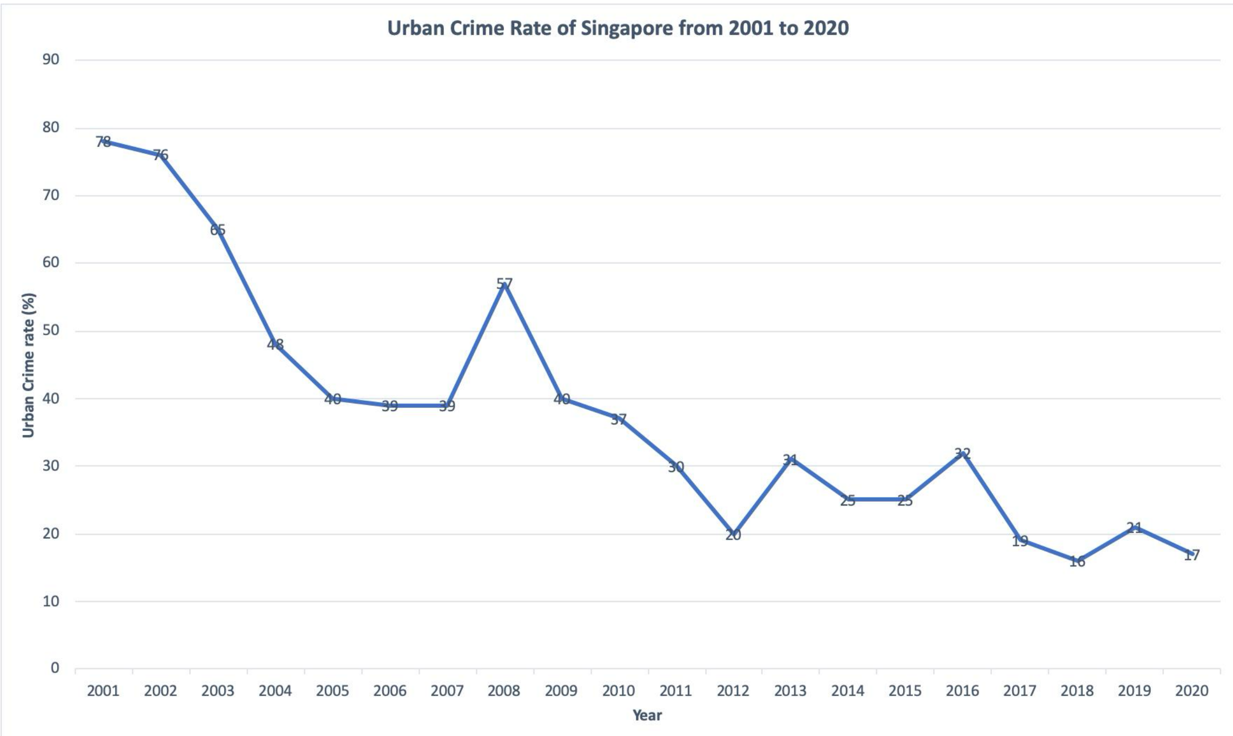
The real interest rate refers to the nominal interest rate adjusted for inflation. It represents the return on an investment or the cost of borrowing after eliminating the effect of inflation. Monitoring and understanding changes in real interest rates is essential in making financial decisions, assessing investment opportunities, and managing borrowing costs effectively. It also plays a significant role in economic analysis and monetary policy formulation. So it is pretty important to provide a more accurate measure of the true return on investment or the actual cost of borrowing.

From the graph of the real interest rate of Singapore from 2001 to 2020, the real interest rate is positive for all periods except 2007. The positive real interest rate means that the nominal interest rate is higher than the inflation rate, resulting in an increase in the purchasing power of money over time. On the other hand, the negative real interest rate indicates that the nominal interest rate is lower than the inflation rate, which can also be a sign of some problems of the economy or financial system. The real interest rate for 2007 was negative, which was just before the global financial crisis in 2008. So this negative real interest rate could be corresponded to the forecast of the global financial crisis of 2008. And although the real interest rate in 2008 was relatively high, it still dropped significantly in 2009, which could also be seen as the consequence of the global financial crisis at that time. Therefore, when the economic instability occurs, the trend of real interest rate will also likely to show relatively large fluctuations.

- **Variable 10:**

Urban Crime Rate

Year	Urban Crime Rate (%)
2001	78
2002	76
2003	65
2004	48
2005	40
2006	39
2007	39
2008	57
2009	40
2010	37
2011	30
2012	20
2013	31
2014	25
2015	25
2016	32
2017	19
2018	16
2019	21
2020	17



The urban crime rate refers to the measurement of criminal activity within an urban area or a city. It is a statistical indicator that quantifies the occurrence of various criminal offenses, such as robberies, assaults, property crimes, and so on. It serves as a useful tool for policymakers, researchers, and the general public to assess and monitor crime trends and develop crime prevention strategies within the communities. And it helps to evaluate the safety and security of an urban area, reducing crime and improving the quality of life for residents.

The graph of the urban crime rate of Singapore from 2001 to 2020 tells that with the development of the economy, the overall urban crime rate shows a decreasing trend during these 20 years. But it could also be affected by the economic situations of a specific period of time, which could produce some fluctuations. For example, from 2001 to 2007, Singapore has experienced a period of rapid economic development, so the corresponding urban crime rate fell sharply. But in 2008, due to the global financial crisis, Singapore's economy was affected significantly, and the urban crime rate was pretty high. So the unstable economic environment could exacerbate poverty and widen socioeconomic disparities within the society. And the lack of employment opportunities could also result in financial strain among people. As a result, people would be more vulnerable to engaging in criminal behavior. In 2012, there was a very low crime rate, since Singapore has built safeguards to limit the social impact of gambling. So the regulation of the government was also an important factor for the decreasing trend of urban crime rate in Singapore.

3. Conclusion

In conclusion, Singapore’s economy has undergone significant growth and transformation from 2001 to 2020. The country has established itself as a key player in the global economy. Despite facing challenges, such as the global financial crisis in 2008 and the COVID-19 pandemic in 2020, Singapore’s economy has remained resilient and has consistently shown strong growth. With its strong economic fundamentals, strategic location, and friendly policies, Singapore is poised for continued growth and success in the future.

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