CHINA ECONOMY AND POLICIES RESPONSE TO THE COVID – 19 PANDEMIC

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Abstract

Despite the COVID-19 Pandemic demonstrating unprecedented economic impacts on China, economic reports indicate why and how China's economy evolved during the pandemic. This study investigates the direction of the China economy subject to the COVID – 19 Pandemic impacts. Furthermore, it analyses China's COVID-19 Pandemic Policies' effectiveness and the outcome of the policies' changes in the COVID-19 Pandemic cases and China's economy in 2020. The methodology of Simple Linear Regression played a role in addressing the objectives of the study. The study's findings revealed the relationship between the COVID-19 Pandemic cases and China's economic growth is negative. That is, as the COVID-19 Pandemic spreads, the Chinese economy suffers, and vice versa.More significantly, the implemented policies were effective and turned the economy from a negative to a positive position during 2020. Therefore, the significance of the study lies in exhibiting the direction of the Chinese economy subject to the COVID-19 Pandemic cases, furthermore revealing the effectiveness of China's COVID-19 Pandemic policies and the outcome of the policies on COVID-19 Pandemic cases and the Chinese economy during the year 2020.
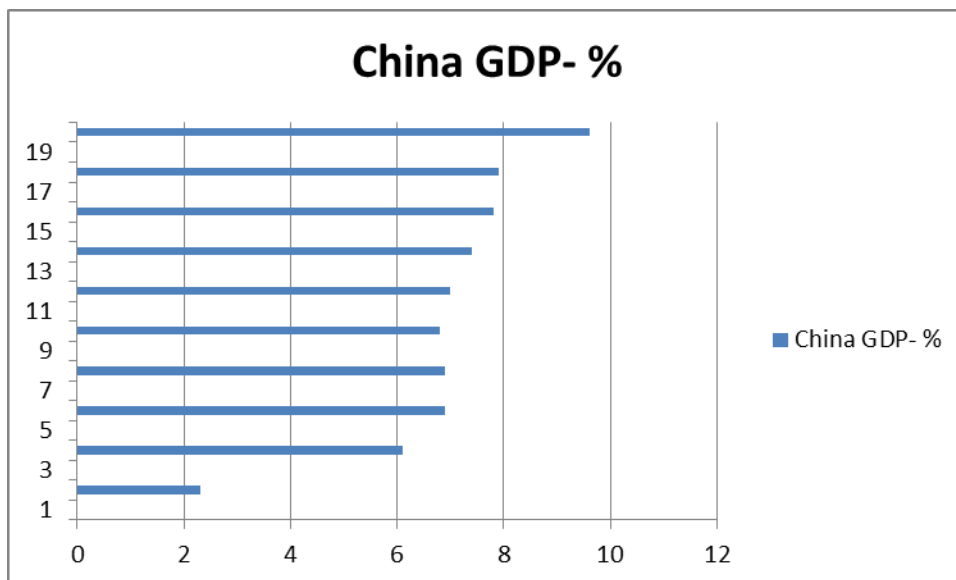
COVID-19 Pandemic; China's Economy; GDP; COVID-19 Policies; Effectiveness

Introduction to

In December 2019, China reported new pathogens called SAR-CoV-2 in Hubei Province, Wuhan City (WorldHealthOrganization 2021). In March 2020, the WHO named the infectious disease COVID-19 Pandemic, instantly recognising its emergence as global in nature, which naturally requires public attention (Kumar, Malviya, and Sharma 2020). As of July 4, 2021, 184,336,662 registered COVID-19 pandemic cases, 3,989,214 deaths, and 168,690,862 recovered cases (World-Health-Statistics 2020). Economically, there has been an unprecedented contraction in GP due to the COVID-19 pandemic (World-Health-Statistics 2020). Global statistics show that global GDP in 2020 is US $84.5 trillion, close to US $3 trillion lower than in 2019 (Parikh et al. 2020). The COVID-19 pandemic demonstrated the unprecedented economic impact on China; as a practical example, in Q1 2020, China recorded a negative contraction of 6.8 GDP (Chen et al. 2020).

In the last ten years, China's GDP statistics have changed.

From the graph perspective, from top to bottom; the first top line is the year of 2011, when China GPD recorded 9.6%; 2012 recorded 7.9; 2013 recorded 7.8, 2014 recorded 7.4, 2015 recorded 7.0, 2016 recorded 6.8, 2017 recorded 6.9, 2018 recorded 6.7, 2019 recorded 6.1, and 2020, due to the outbreak of the Coronavirus, China recorded a remarkable contraction of GDP of 2.3% (Chen et al. 2020).


Source: China Economic Statistics

China monthly GDP Statistics during the year 2020

Graph – 1

The graph upholds and proves the negative relationships between the Covid – 19 Pandemic cases and China's economic growth during the year 2020. The relationship between the Covid – 19 Pandemic cases and China's Economic growth is negative from the graphic illustrations. The negative relationships mean that when the Covid – 19 Pandemic cases increase, China's economic growth declines throughout 2020. In the graph, the blue line representing the Covid – 19 Pandemic cases, whiles the red line representing China's economic growth.
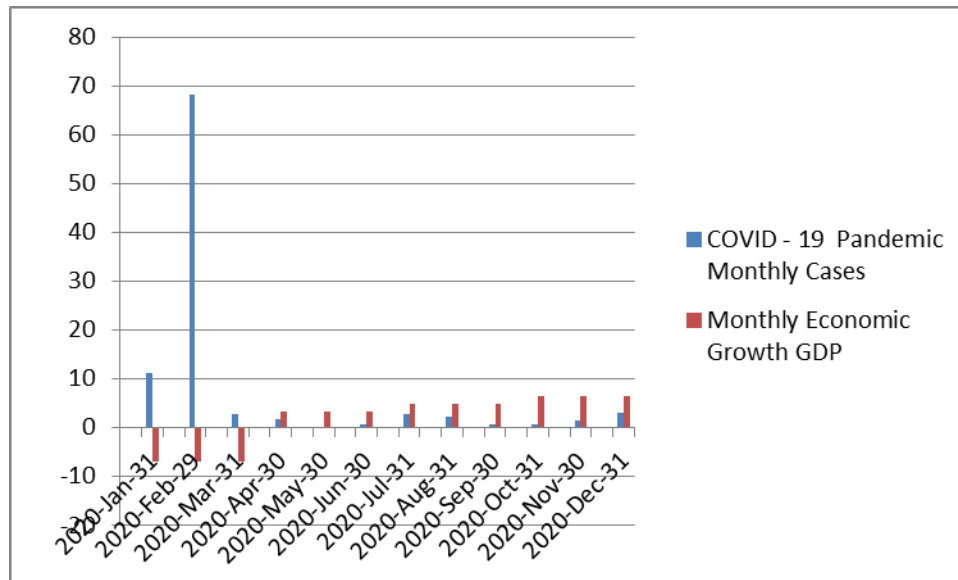
Source: Appendix – 5

The motivation for the study

The significant evidence illustrating why and how China's economy evolved during the COVID-19 Pandemic is a potential driver for this study to be undertaken (Hu et al. 2021). Although the COVID-19 Pandemic demonstrated unprecedented economic impacts for China, as a practical example, in Q1 2020, China recorded a negative contraction of 6.8 GDP. Literature and statistics reveal that effective Chinese government policies and rapid response to the pandemic are the main reasons for the Chinese economy's evolving amid the pandemic. These policies further proved how they transformed the Chinese economy from a negative in the first quarter of 2020 to a positive in the remaining three quarters of 2020 (Xing and Zhang 2021).

The Chinese government's policies, strategies, and health system are effective and have contributed significantly to the response, mitigation, and eradication of the COVID-19 pandemic in China (Hu et al. 2021). In a practical example, fiscal and monetary policies have transformed China's economy from negative 6.8 in Q1 of 2020 to positive figures throughout the remaining three quarters of 2020 (Xing and Zhang 2021).

The Significance of the Study

The significance of the study lies in exhibiting the direction of the Chinese economy subjected to the COVID-19 Pandemic cases, furthermore revealing the effectiveness of China's COVID-19

Pandemic policies and the outcome of the policies on COVID-19 Pandemic cases and the Chinese economy during the year 2020.

Research Questions and Methodology

Research Questions

1. What is the direction of China's economy subject to the COVID–19 pandemic impacts?

2. Are China's COVID-19 Pandemic policies effective?

3. What are the repercussions of China's COVID – 19 Pandemic implemented Policies on COVID – 19 Pandemic cases and China's economic growth?

The methodology

The methodology of Simple Linear Regression played a role in addressing the objectives of the study. First, the study tested the relationships of the COVID – 19 Pandemic cases and China's economic growth in understanding the direction of the China economy subject to the COVID – 19 Pandemic cases. After that, the study tested the relationships between the COVID-19 Pandemic cases and the time movement in responding to the pandemic to understand the outcome of the COVID-19 Pandemic cases subject to the policies implemented to control the outbreak. Then, empirically, through carefully reviewing the recent literature, the study investigated and revealed the economic impacts of the COVID-19 Pandemic on China's economy. It furthermore investigated and exhibited evidence on the effectiveness of China's COVID-19 Pandemic Policies and the outcome of the policies on the changes of the COVID-19 Pandemic cases and China's economic growth during the year 2020.

Findings of the Study and Practical Implications

The study's findings revealed the relationship between the COVID-19 Pandemic cases and China's economic growth is negative. That is, as the COVID-19 Pandemic spreads, the Chinese economy suffers, and vice versa.However, more significantly, the implemented policies were effective and turned the economy from negative to positive during 2020. Therefore, the significance of the study lies in exhibiting the direction of the Chinese economy subject to the COVID-19 Pandemic cases, furthermore revealing the effectiveness of China's COVID-19 Pandemic policies and the outcome of the policies on COVID-19 Pandemic cases and the Chinese economy during the year 2020.

The objective of the study is to

This study investigates the direction of the China economy subject to the COVID – 19 Pandemic impacts. Furthermore, it analyses China's COVID-19 Pandemic Policies' effectiveness and the outcome of the policies' changes in the COVID-19 Pandemic cases and China's economy in 2020.
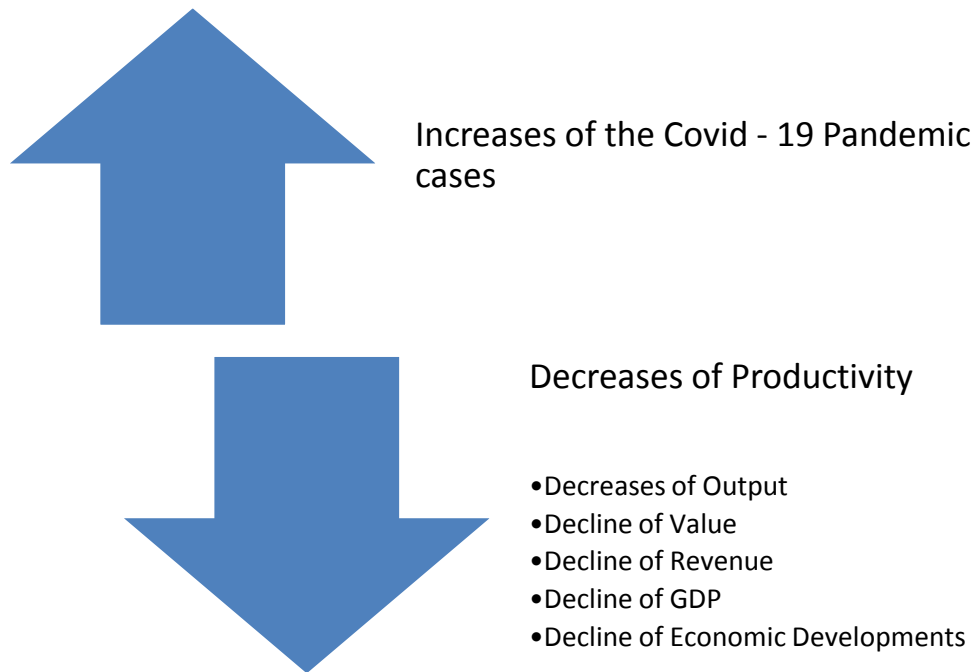
Summary of the chapter

The following chapters of the study made a significant contribution to the accomplishment of the study; The Impacts of the COVID-19 Pandemic on China's Economic Growth; Effectiveness of China's COVID-19 Pandemic Policies; The repercussions of effective policies on the changes of the COVID-19 pandemic cases and China's economic growth; Methodology; Findings of the study and Practical Implications; Conclusion.

The Impacts of the COVID-19 Pandemic on China's Economic Growth

The accelerating number of research, statistics, and quantitative evidence illustrating that the COVID-19 pandemic delivers significant impacts on China's economic growth during the year 2020 (Maliszewska, Mattoo, and Van Der Mensbrugghe 2020). The pandemic's economic impact revealed significant deterioration in industrial productivity, output, value, GDP, and economic developments due to increased COVID-19 outbreaks (Tanjangco et al. 2020).

Model Illustrations

The following diagram model sufficiently illustrates the movement increases of the COVID – 19 Pandemic cases and the repercussions contraction outcome of China's industrial productivity, outputs, and the value of goods, GDP, and economic developments at large during the year 2020 (Tanjangco et al. 2020).

Increases of the Covid - 19 Pandemic cases

Decreases of Productivity

- Decreases of Output
- Decline of Value
- Decline of Revenue
- Decline of GDP
- Decline of Economic Developments

The model accurately supporting the quantitative findings that; the regression results indicate a negative relationship between the Covid – 19 Pandemic cases and China's economic growth (GDP) during the entire year of 2020. Therefore, the interpretation of the results is that when the Covid – 19 Pandemic cases increases, China's economic growth moves in the opposite direction (declined) and vice versa.

Graph – 1

The graph upholds and proves the negative relationships between the Covid – 19 Pandemic cases and China's economic growth during the year 2020. The relationship between the Covid – 19 Pandemic cases and China's Economic growth is negative from the graphic illustrations. The negative relationships mean that when the Covid – 19 Pandemic cases increase, China's economic growth declines throughout 2020. In the graph, the blue line representing the Covid – 19 Pandemic cases, whiles the red line representing China's economic growth.
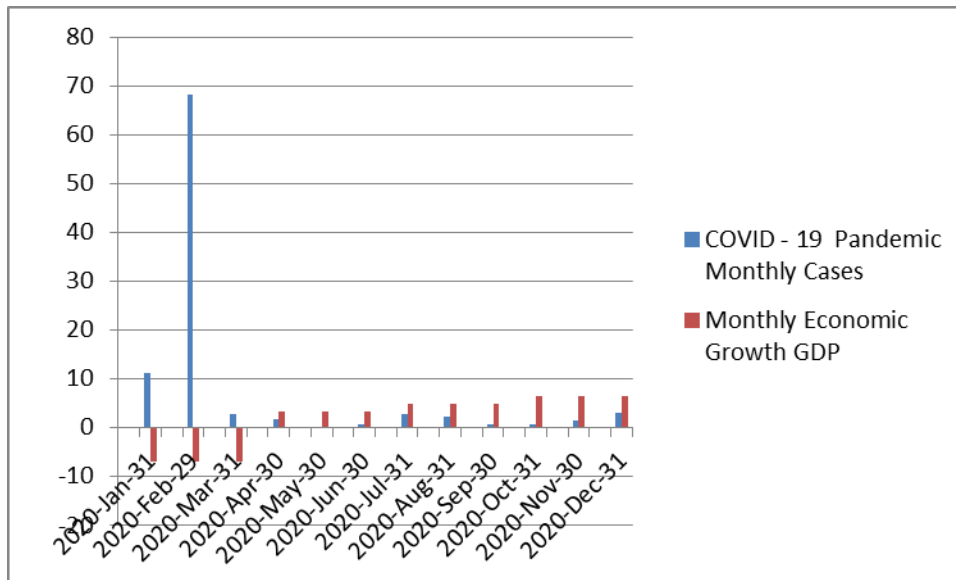
Source: Appendix – 5

Appendix – 5

Date	COVID - 19 Pandemic Monthly Cases Divided by 1000	Monthly Economic Growth GDP
2020-Jan-31	11.2	-6.8
2020-Feb-29	68.1	-6.8
2020-Mar-31	2.9	-6.8
2020-Apr-30	1.7	3.2
2020-May-30	0.2	3.2

2020-Jun-30	0.7	3.2
2020-Jul-31	2.9	4.9
2020-Aug-31	2.2	4.9
2020-Sep-30	0.7	4.9
2020-Oct-31	0.8	6.5
2020-Nov-30	1.5	6.5
2020-Dec-31	3.1	6.5

Source: World Health Organization & China Economic Statistics

The following literature profoundly discusses the impacts of the COVID – 19 Pandemic on China's productivity, outputs, value, GDP, and economic developments due to the increases of the COVID – 19 Pandemic cases.

Economic data and statistics sufficiently indicate the shrinkage of China's productivity, output, value, revenue, GDP, and economic developments as the repercussions of the Covid – 19 Pandemic impacts during the year 2020 (UNDP 2020). They are focusing on highlighting the substantial contraction in Chinese economic growth. World Bank Group research shows the tremendous impacts of the COVID-19 pandemic on gross domestic product and trade (Jackson et al. 2020). China's productivity, output, revenue, and economic developments declined significantly during 2020 (Xiarewana and Civelek 2020). ODI Economic Pulse Series undertook the potential research study. The study findings indicate a significant contraction of China's Economic Growth (GDP) and value in the First Quarter of 2020. China record -6.8 GDP due to the Covid-19 global pandemic impacts (Qian and Fan 2020). Carefully consider the particular circumstances in the Study (Xiarewana and Civelek 2020) undertaken to analyze the effects of the COVID-19 pandemic on the Chinese economy and the world. Their study shows China's domestic product, productivity, output, and value contraction trends during the year 2020 (Yang et al. 2020).

Effectiveness of China's COVID – 19 Pandemic Policies & The repercussions of the effective policies on the changes of the COVID – 19 pandemic cases and China's Economic growth

The proliferated literature indicating that the China government's COVID – 19 Pandemic policies are effective and significantly contributed to controlling the COVID – 19 Pandemic and eliminating the COVID – 19 Pandemic Cases across China. The implemented policies transformed the economy from a negative position in the first quarter of 2020 to a positive position in the remaining three quarters of 2020 (Alberola-Ila et al. 2020).

In this part of the study, the comprehensive discussion will focus on the two segments: the effectiveness of China's COVID – 19 Pandemic policies and the repercussions of the effective policies on the changes of the COVID – 19 pandemic cases and China's economic growth during the year of 2020.

Effectiveness of China's COVID – 19 Pandemic Policies

China's government employed an extensive set of policies towards responding promptly and progressively eliminating the Covid – 19 Pandemic, like Covid – 19 Pandemic policies, fiscal and monetary policies (Alberola-Ila et al. 2020). More remarkably, the flourishing number of research and statistical proof demonstrating that China policies in response to the Covid – 19 Pandemic are effective and contributed largely to promptly declining and gradual elimination of the Covid – 19 Pandemic cases across China (Benmelech and Tzur-Ilan 2020). The comprehensive set of the China Government Policies in response to the Pandemic is the Covid – 19 Pandemic policies, fiscal and monetary policies, more particularly are;

In the context of the Covid – 19 Pandemic policies, China declared a series of policies and measures, including a total lockdown of the country, social distancing, traveling restrictions, and banning of all public events (Liu, Yue, and Tchounwou 2020). In the context of the Fiscal policies; the China governments introduced a budget of RMB 4.8 Trillion which is equivalent to about 4.7% of the GDP, for supporting the specific target of actions in responding to the Pandemic, such as the production of medical equipment's, and increase spending on Epidemic control and prevention (Loayza and Pennings 2020). In the context of monetary policies; The People Bank of China (PBC) puts new measures for financial market stability safeguarding at the Monetary and microfinance policy context. These measures include; more injection of liquidity into the banking system through open market operations. In addition, further expansion of the re-lending and re-discounting facilities by 1.8 Trillion supports industry producers of the medical equipment's and daily necessities, agriculture sector, micro, small, and medium-sized operating business firms (Alberola-Ila et al. 2020).

Quantitative Proof of China's Policies Effectiveness in Response to the COVID – 19 Pandemic through a Normal Distribution Curve

The study demonstrated the quantitative proof of the China government's COVID – 19 Policies effectiveness through a Normal distribution curve. The Normal distribution curve plays the role of describing the rapid speed and time spent to respond and start recovering from the COVID – 19 Pandemic. The measurement of the instantaneous speed in response to the COVID – 19 Pandemic was measured by observing the line of the Normal distribution curve from the origin point to the top and bending point of the curve. Thus, the line represents the movement of the COVID – 19 Pandemic cases against the time spent.

Refer to the Normal distribution curve below; The Curve reveals that; China spent 120 days to reach the top and bending point of the curve. Therefore, 120 days is the number of days China responded and started recovering from the COVID – 19 Pandemic. The implication of the policy's effectiveness is; the 120 days to respond and start recovering from the Pandemic is likely the shorter time spent to respond to the Pandemic and manage it. Thus, the rapid response of China to the COVID – 19 Pandemic reflects the effectiveness of the policies employed and implemented to respond to the Pandemic.

China Normal Distribution -1

The following is the Normal distribution curve for China, showing the trend movements for responding and starting recovering from the COVID – 19 Pandemic during 2020. The response and start recovering from the COVID – 19 Pandemic illustrated through the movements of the COVID – 19 Pandemic cases against the time. The blue curve line (Series1) represents the trend movement of the COVID – 19 Pandemic cases within the year 2020.
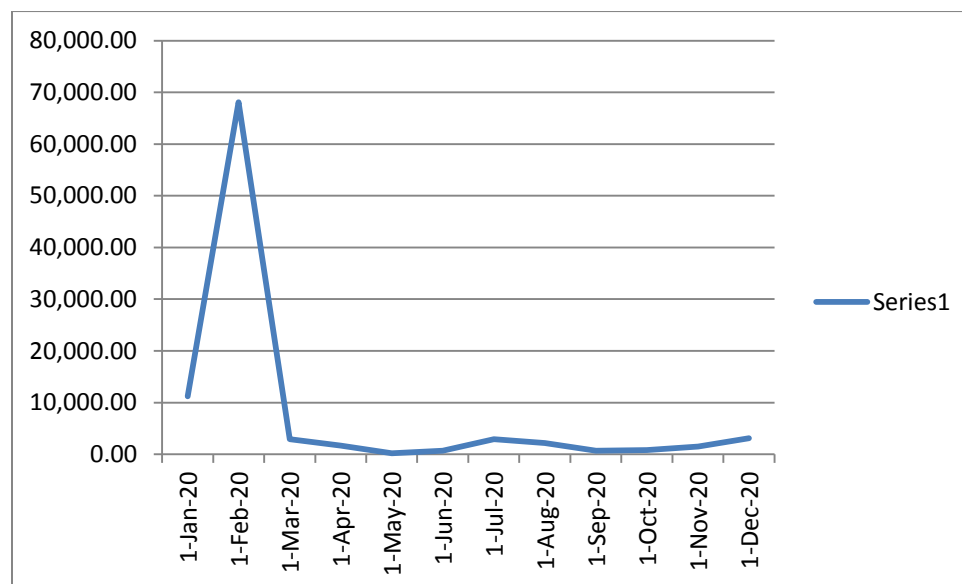
Source: Appendix – 3

Literatures discussion regarding the effectiveness of the China government policies in response to the COVID – 19 Pandemic

The Chinese government's policies, strategies, and health system are effective and have contributed significantly to the response, mitigation, and eradication of the COVID-19 pandemic in China(Hu et al. 2021). In a practical example, fiscal and monetary policies have transformed China's economy from negative 6.8 in Q1 of 2020 to positive figures throughout the remaining three quarters of 2020 (Xing and Zhang 2021). The literature study of (Alberola-Ila et al. 2020) focused on discussing China's tax and monetary measures in response to the COVID – 19 Pandemic, such as emerging markets (Alberola-Ila et al. 2020). The study results highlighted China's Government policies used to address the pandemic are effective and have become a significant point in suppressing and eliminating pandemic cases in China (Alberola-Ila et al. 2020). In exemplifying the application and success of fiscal and monetary policies in the global states with China no exemption, the research study of (Benmelech and Tzur-Ilan 2020) focusing on identifying the determinants and impacts of China's fiscal and monetary policies for the global Economy in responding to the Covid-19 global pandemic. Study findings revealed that China's fiscal and monetary policies showed potential results that helped fight and control the pandemic during the year 2020 (Benmelech and Tzur-Ilan 2020).

Repercussions of China's Effective Policies on Changes of COVID – 19 Pandemic Cases and Economic Growth (GDP)

Through the Normal distribution curve observations accompanied by the literature review, the repercussions of effective China's policies on the changes of the Covid – 19 pandemic and economic growth is; Covid – 19 Pandemic cases decreases and the Economic growth (GDP) increases from the date policies exhibit the effectiveness, on February 15, 2020.

By observing the movement of the Normal distribution curve, the top and bending point of the curve is the start point to watch the repercussions of China's effective policies on changes of the COVID – 19 Pandemic cases and economic growth. For example, consider the Normal distribution – 1, which shows that China reaches at the top and bending point of the curve on dated February 15, 2020. Thus, from dated February 15, 2020, we can observe the repercussions of China's effectiveness policies on the changes of the Covid – 19 Pandemic cases and the economic growth up to December 2020.

Consider the Normal distribution curve – 2, the observation of the movements of the lines of the Normal distribution curve shows that; from dated February 15, 2020, the repercussions of China's effective policies are the decreases of the Covid – 19 Pandemic cases and the increases of China's economic growth. Carefully observe the movements of the two lines of the Normal distribution curves; it illustrates that from dated February 15, 2020, the COVID – 19 Pandemic cases go down while the line of the China economic growth goes up. Thus, the direction of the

two lines of the Normal distribution curve from dated February 15, 2020, is due to the policies' effectiveness in responding to the COVID – 19 Pandemic.

The Normal Distribution Curve – 2
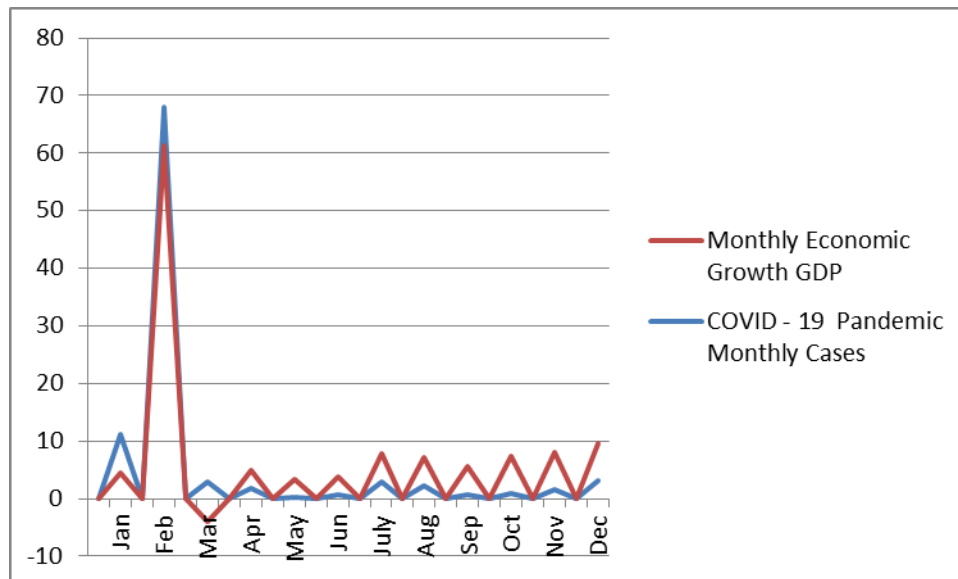
Source: Appendix – Appendix 5

Literature supporting Repercussions of China's Effective Policies on Changes of COVID – 19 Pandemic Cases and Economic Growth (GDP)

Although The COVID-19 Pandemic demonstrated unprecedented economic impacts for China, in a practical example, in Q1 2020, China recorded a negative contraction of 6.8 GDP. Literature and statistics revealed that effective China Government policies and rapid response to the Pandemic are the main reason for the China economy evolving amid the Pandemic. These policies further proved how transformed the China economy from negative in the First Quarter of the year 2020 to a positive figure in the remaining three quarters of 2020 (Xing and Zhang 2021). The Chinese government's policies, strategies, and health system are effective and have contributed significantly to the response, mitigation, and eradication of the COVID-19 pandemic in China(Hu et al. 2021). In a practical example, fiscal and monetary policies have transformed China's economy from negative 6.8 in Q1 of 2020 to positive figures throughout the remaining three quarters of 2020 (Xing and Zhang 2021).

Due to the effectiveness of Chinese government policies, the COVID-19 pandemic outbreak under control, and cases have decreased significantly through the Chinese government's epidemic policies and hospital strategies (Tan et al. 2021). Effective policies and actions in hospitals and workplaces are among the key drivers of the ongoing decline in COVID-19 Pandemic cases in China (Cirrincione et al. 2020). As a result, the Pandemic demonstrated unprecedented impacts on South Asia Region Economic. However, in exceptional cases China

region, due to the Pandemic's effective policies and rapid response, the economy moved from negative GDP in the first quarter of 2020 to positive GDP in the remaining three quarters of 2020 (Islam et al. 2020).

Methodology

Model & Data Analysis

The study typically employed a simple linear regression model to evaluate the Covid – 19 Pandemic impacts on China's economic growth, carefully examining the effectiveness of the coronavirus- 19 Pandemic policies through figuring out the relationships of the Covid – 19 Pandemic cases and the time utilized in response to the Pandemic. In particular, the study used the Simple regression model in double log and Semi Log-Linear Models.

The study's reliable data sources are the World Health Organization and China Government Economic Statistics for 2020.

Research Design

The study typically applied a descriptive and analytical research design where various tables, graphs, figures, and graphs were submitted to illustrate the possible results of the investigation. In addition, the econometric and statistical tools used to analyze the impacts of the COVID- 19 Pandemic on China's economic growth. Furthermore, analyzing China Government policies through measuring the economic relationship between COVID-19 Pandemic cases and the movement of time (Number of days). Finally, focus on analyzing findings of the study; the quantitative approach method used through the practical application of 2007 Microsoft Excel and the EVIEW econometric tools (3.0 versions).

Evaluating the Impacts of the Covid – 19 Pandemic on China Economic Growth & Effectiveness of China's Covid – 19 Pandemic Policies

Evaluating the Impacts of the Covid – 19 Pandemic on China Economic Growth

Focusing on evaluating the impacts of the Covid-19 global pandemic on the China Economy, the study considered the Covid-19 global pandemic cases as the independent variable and China economic growth (GDP) as the dependent variable. Then, running the regression between the Covid-19 global pandemic cases and the China Economic growth during the year 2020.

The results interpretation; the negative results meaning that in an instant, the Covid-19 global pandemic cases were increasing the China Economic growth (GDP) decreased. A positive result, meaning that when the Covid-19 pandemic cases increases and China's Economic growth increases as well.

Effectiveness of China's Covid – 19 Pandemic Policies

The study carefully applied a Simple linear regression for evaluating the effectiveness of China's Covid – 19 Pandemic policies. Furthermore, the study assumed that the number of days was the independent variable while the Covid – 19 Pandemic cases as the dependent variable in accurately determining the effectiveness of China's Covid – 19 Pandemic policies.

Model

The study typically employed a simple linear regression model to evaluate the Covid – 19 Pandemic impacts on China's economic growth. In particular, the study utilized the Simple regression model in double log and Semi Log-Linear Models.

The fundamental linear regression equation is the following;

In Yi = A   +   Bt + Ci……………………………………………...…………………………. (1)

Whereby; "A" and "B" are the study's coefficients

"Ci" is the identified random variable.

"Yi" is a dependent variable.

And "t" is the time duration.

Quantitative Assessment of the Impacts of the Covid-19 Global Pandemic on China's Economic Growth (GDP)

The regression results indicate a negative relationship between the Covid – 19 Pandemic cases and China's economic growth (GDP) during the entire year of 2020. The regression results (Table – 1 below) illustrate that the relationships between the Covid-19 Pandemic cases and China's economic growth (GDP) are a negative number – 0.00012636143. The interpretation of the results is that when the Covid – 19 Pandemic cases increases, China's economic growth moves in the opposite direction (declined) by the rate -0.00012636143, and vice versa.

Graph Proof

The graph upholds and proves the negative relationships between the Covid – 19 Pandemic cases and China's economic growth during the year 2020. The relationship between the Covid – 19 Pandemic cases and China's Economic growth is negative from the graphic illustrations. The negative relationships mean that when the Covid – 19 Pandemic cases increase, China's

economic growth declines throughout 2020. In the graph, the blue line representing the Covid – 19 Pandemic cases, whiles the red line representing China's economic growth.
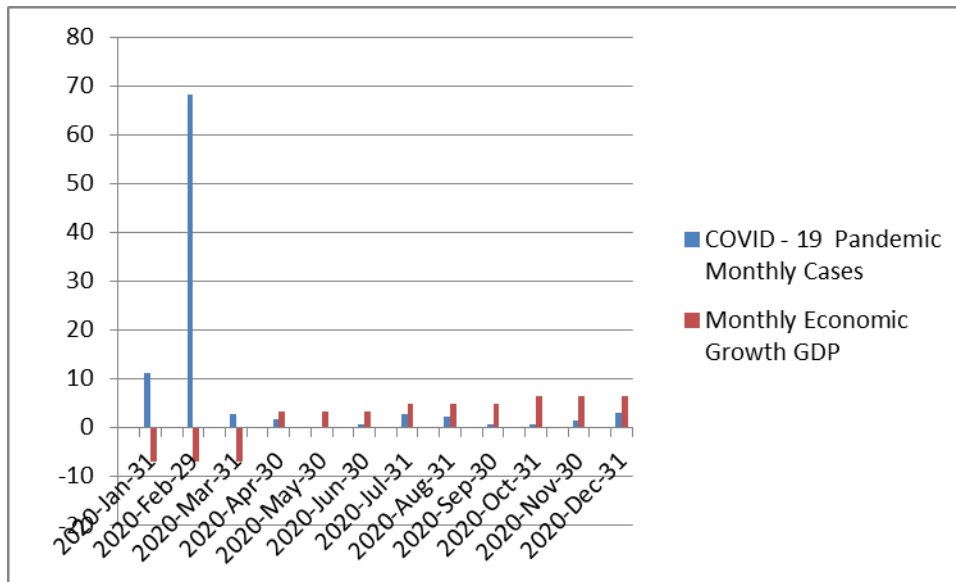
Source: Appendix 5

Table – 1

The following table shows the regression results regarding the relationships between the Covid-19 global pandemic cases and the China Economic Growth (GDP) during 2020. The study assumes China's Economic Growth (GDP) is a dependent variable, while the COVID – 19 Pandemic cases are the independent variable.

Variables	Coefficient	Standard Error Estimated	T-Statistic	Probability
Slope – Regression line	-0.00012636143	3.8	-2.1118	0
Constant	35.53			

R- Squared	0.196668268			
Correlation Coefficient – r	0.443472961			
Standard Deviation	0.00005983600			
Number of Experiments (Observation)	12			

Source; Appendix 1, 2, & 3

Appendix – 1

The following is the data for China, which indicates China's monthly economic growth (GDP), the COVID – 19 Pandemic cases, and the number of days employed in responding to the pandemic during the year 2020.

Date	No. Of Days	Region	Continent	Name Of Country	COVID-19 Cases	Economic Growth (GDP)
31-01-2020	31	East Asia	Asia	China	11,200	-6.8
29-02-2020	60	East Asia	Asia	China	79,300	-6.8
31-03-2020	91	East Asia	Asia	China	82,200	-6.8
30-04-2020	121	East Asia	Asia	China	83,900	3.2
31-05-2020	152	East Asia	Asia	China	84,100	3.2
30-06-2020	182	East Asia	Asia	China	84,800	3.2
31-07-2020	213	East Asia	Asia	China	87,700	4.9
31-08-2020	244	East Asia	Asia	China	89,900	4.9
30-09-2020	274	East Asia	Asia	China	90,600	4.9
31-10-2020	305	East Asia	Asia	China	91,400	6.5
30-11-2020	335	East Asia	Asia	China	92,900	6.5
31-12-2020	366	East Asia	Asia	China	96,000	6.5

GRAND TOTAL	366				96,000	23.4

Source: The World Health Organization & China Government Statistics for the year 2020

Appendix – 2

The following are the regression calculations and outcome of variables – China's economic growth (GDP), represented by Y, and the COVID – 19 Pandemic cases, represented by X, during 2020.

Date	No. of Days	COVID - 19 Pandemic Cases- (X)	China's Economic Growth GDP-(Y)	XX	YY	XY
31-01-2020	31	11200	-6.8	125440000	46.24	-76160
29-02-2020	60	79300	-6.8	6288490000	46.24	-539240
31-03-2020	91	82200	-6.8	6756840000	46.24	-558960
30-04-2020	121	83900	3.2	7039210000	10.24	268480
31-05-2020	152	84100	3.2	7072810000	10.24	269120
30-06-2020	182	84800	3.2	7191040000	10.24	271360
31-07-2020	213	87700	4.9	7691290000	24.01	429730
31-08-2020	244	89900	4.9	8082010000	24.01	440510
30-09-2020	274	90600	4.9	8208360000	24.01	443940
31-10-2020	305	91400	6.5	8353960000	42.25	594100
30-11-2020	335	92900	6.5	8630410000	42.25	603850
31-12-2020	366	96000	6.5	9216000000	42.25	624000
Grand Total	366	96000	23.4	84655860000	368.22	2770730

Source: Regression Calculations

Appendix – 3

The following are the regression calculations and outcome of variables – China's economic growth (GDP), represented by Y, and the actual monthly marginal change COVID – 19 Pandemic cases, represented by X, during 2020.

Date	Number of Days	Actual Monthly COVID-19 Cases - (X)	China's Economic Growth GDP - (Y)	XX	YY	XY
31-01-2020	31	11200	-6.8	125440000	46.24	-76160
29-02-2020	60	68100	-6.8	4637610000	46.24	-463080
31-03-2020	91	2900	-6.8	8410000	46.24	-19720
30-04-2020	121	1700	3.2	2890000	10.24	5440
31-05-2020	152	200	3.2	40000	10.24	640
30-06-2020	182	700	3.2	490000	10.24	2240
31-07-2020	213	2900	4.9	8410000	24.01	14210
31-08-2020	244	2200	4.9	4840000	24.01	10780
30-09-2020	274	700	4.9	490000	24.01	3430
31-10-2020	305	800	6.5	640000	42.25	5200
30-11-2020	335	1500	6.5	2250000	42.25	9750
31-12-2020	366	3100	6.5	9610000	42.25	20150
Grand Total	366	96000	23.4	4801120000	368.22	-487120

Source: Regression Calculations

Effectiveness of China's COVID – 19 Pandemic Policies & The repercussions of the effective policies on the changes of the COVID – 19 pandemic cases and China's Economic growth

In this methodological segment, the quantitative evaluation will focus on three sub-segments which are;- Quantitative Evaluation of China's COVID – 19 Pandemic Policies Effectiveness; Quantitative Proof of China's Policies Effectiveness in Response to the COVID – 19 Pandemic through a Normal Distribution Curve; Repercussions of China's Effective Policies on Changes of COVID – 19 Pandemic Cases and Economic Growth (GDP).

1. **Quantitative Evaluation of China's COVID – 19 Pandemic Policies Effectiveness**

The regression results declare a negative relationship between the time spent in response to the pandemic (time movement) and the COVID – 19 Pandemic cases in China during 2020.

The regression slope line indicates the negative outcome of – 18,560 (See table – 2).

Meaning that, as the time (independent variable) increases, the COVID– 19 Pandemic cases decrease. The implication of this result is the China's COVID -19 Pandemic policies were effective and fruitful.

Table – 2

The following table shows the regression results regarding the relationships between the Covid-19 global pandemic cases and 2020. The study assumes time is an independent variable, while the COVID – 19 Pandemic cases are the dependent variable.

Variables	Coefficient	Standard Error Estimated	T-Statistic	Probability
Slope – Regression line	-18 560	0.7745	-53 584	0
Constant	6888960			
R- Squared	0.427055976			
Correlation Coefficient – r	0.6534952			
Standard Deviation	0.346366929			
Number of Experiments	12			

Source; Appendix 4

Appendix – 4

The following are the regression calculations and outcome of variables – Time movement, represented by X, and the actual monthly marginal change COVID – 19 Pandemic cases,

represented by Y, during 2020. The study assumes time is an independent variable, while the COVID – 19 Pandemic cases are the dependent variable.

Date	Marginal Change Of Number of Days	Actual Marginal Change of COVID – 19 Cases	XX	YY	XY
31-01-2020	31	11200	961	125440000	347200
29-02-2020	29	68100	841	4637610000	1974900
31-03-2020	31	2900	961	8410000	89900
30-04-2020	30	1700	900	2890000	51000
31-05-2020	31	200	961	40000	6200
30-06-2020	30	700	900	490000	21000
31-07-2020	31	2900	961	8410000	89900
31-08-2020	31	2200	961	4840000	68200
30-09-2020	30	700	900	490000	21000
31-10-2020	31	800	961	640000	24800
30-11-2020	30	1500	900	2250000	45000
31-12-2020	31	3100	961	9610000	96100
Grand Total	366	96000	11168	4801120000	2835200

Source: Regression Calculations

1. **Quantitative Proof of China's Policies Effectiveness in Response to the COVID – 19 Pandemic through a Normal Distribution Curve**

The study demonstrated the quantitative proof of the China government's COVID – 19 Policies effectiveness through a Normal distribution curve. The Normal distribution curve plays the role of describing the rapid speed and time spent to respond and start recovering from the COVID –

19 Pandemic. The measurement of the instantaneous speed in response to the COVID – 19 Pandemic was measured by observing the line of the Normal distribution curve from the origin point to the top and bending point of the curve. Thus, the line represents the movement of the COVID – 19 Pandemic cases against the time spent.

Refer to the Normal distribution curve below; The Curve reveals that; China spent 120 days to reach the top and bending point of the curve. Therefore, 120 days is the number of days China responded and started recovering from the COVID – 19 Pandemic. The implication of the policy's effectiveness is; the 120 days to respond and start recovering from the Pandemic is likely the shorter time spent to respond to the Pandemic and manage it. Thus, the rapid response of China is the repercussion of the effectiveness of the policies employed by China for responding to the COVID– 19 Pandemic.

China Normal Distribution -1

The following is the Normal distribution curve for China, showing the trend movements for responding and starting recovering from the COVID – 19 Pandemic during 2020. The response and start recovering from the COVID – 19 Pandemic revealed through the movements of the COVID – 19 Pandemic cases against the time. The blue curve line (Series1) represents the trend movement of the COVID – 19 Pandemic cases in 2020.
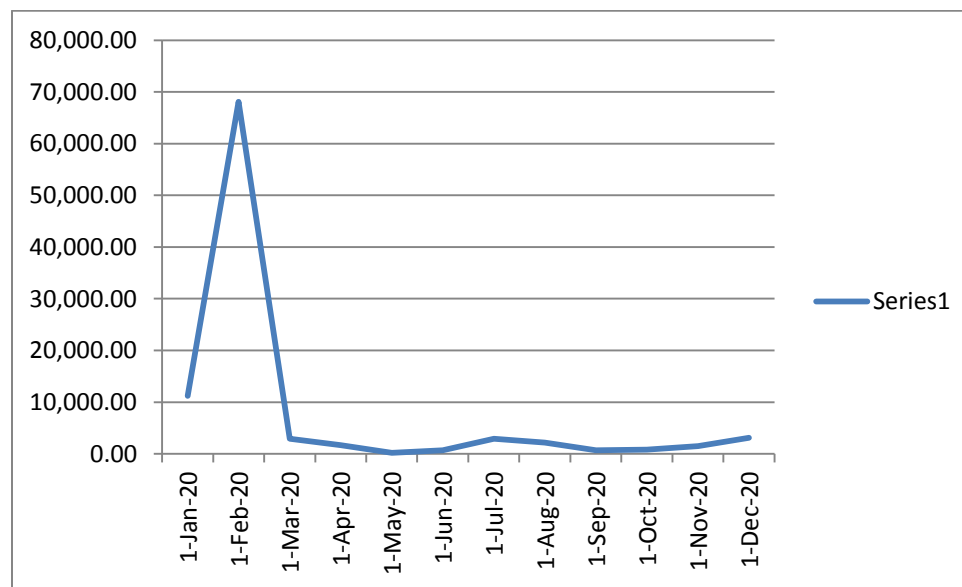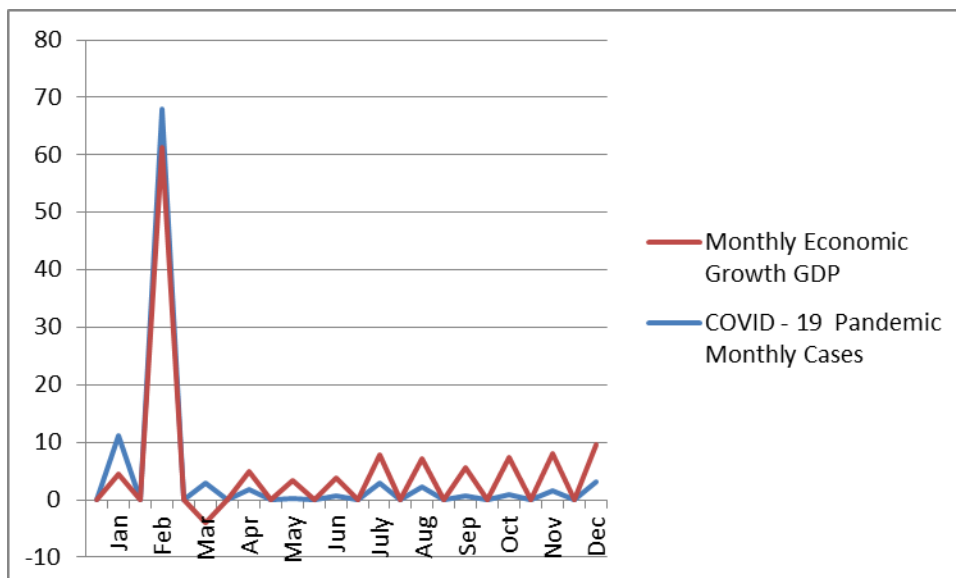

Source: Appendix – 3

2. **Repercussions of China's Effective Policies on Changes of COVID – 19 Pandemic Cases and Economic Growth (GDP)**

Through the Normal distribution curve observations accompanied by the literature review, the repercussions of effective China's policies on the changes of the Covid – 19 pandemic and economic growth is; Covid – 19 Pandemic cases decreases and the Economic growth (GDP) increases from the date policies exhibit the effectiveness, on February 15, 2020.

By observing the movement of the Normal distribution curve, the top and bending point of the curve is the start point to watch the repercussions of China's effective policies on changes of the COVID – 19 Pandemic cases and economic growth. For example, consider the Normal distribution – 1, which shows that China reaches at the top and bending point of the curve on dated February 15, 2020. Thus, from dated February 15, 2020, we can observe the repercussions of China's effectiveness policies on the changes of the Covid – 19 Pandemic cases and the economic growth up to December 2020.

Consider the Normal distribution curve – 2, the observation of the movements of the lines of the Normal distribution curve shows that; from dated February 15, 2020, the repercussions of China's effective policies are the decreases of the Covid – 19 Pandemic cases and the increases of China's economic growth. Carefully observe the movements of the two lines of the Normal distribution curves; it illustrates that from dated February 15, 2020, the Covid – 19 Pandemic cases go down while the line of the China economic growth goes up. Thus, the direction of the two lines of the Normal distribution curve from dated February 15, 2020, is due to the policies' effectiveness in response to the Covid – 19 Pandemic (The Normal distribution curve – 2).

The Normal Distribution Curve - 2

Source: Appendix – 5

Methodology Conclusion

The study's findings revealed the relationship between the COVID-19 Pandemic cases and the China economic growth is negative. Meaning that when the COVID-19 Pandemic cases increase, the China economy decreases, and vice versa. But, more significantly, the implemented policies were effective and turned the economy from negative to positive during 2020.

Findings of the Study and Practical Implications

The study's findings revealed the relationship between the COVID-19 Pandemic cases and the China economic growth is negative. Meaning that when the COVID-19 Pandemic cases increase, the China economy decreases, and vice versa. However, more significantly, the implemented policies were effective and turned the economy from negative to positive during 2020. Therefore, the significance of the study is exhibiting the direction of the China economy subject to the COVID – 19 Pandemic cases, furthermore revealing the effectiveness of China's COVID – 19 Pandemic policies and the outcome of the policies on COVID – 19 Pandemic cases and China Economy during the year of 2020.

Conclusion

Although The COVID-19 Pandemic demonstrated unprecedented economic impacts for China, in a practical example, in Q1 2020, China recorded a negative contraction of 6.8 GDP. Literature and statistics revealed that effective China Government policies and rapid response to the Pandemic are the main reason for the China economy evolving amid the Pandemic. These policies further proved how transformed the China economy from negative in the First Quarter of the year 2020 to a positive figure in the remaining three quarters of 2020 (Xing and Zhang 2021). The Chinese government's policies, strategies, and health system are effective and have contributed significantly to the response, mitigation, and eradication of the COVID-19 pandemic in China(Hu et al. 2021). In a practical example, fiscal and monetary policies have transformed China's economy from negative 6.8 in a Q1 of 2020 to positive figures throughout the remaining three quarters of the year 2020 (Xing and Zhang 2021).

The study's findings revealed the relationship between the COVID-19 Pandemic cases and the China economic growth is negative. Meaning that when the COVID-19 Pandemic cases increase, the China economy decreases, and vice versa. However, more significantly, the implemented policies were effective and turned the economy from negative to positive during 2020. Therefore, the significance of the study is exhibiting the direction of the China economy

subject to the COVID – 19 Pandemic cases, furthermore revealing the effectiveness of China's COVID – 19 Pandemic policies and the outcome of the policies on COVID – 19 Pandemic cases and China Economy during the year of 2020.

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Non

Statement of Declaration of research Interest

No Research Interest

Reference

Alberola-Ila, Enrique, Yavuz Arslan, Gong Cheng, and Richhild Moessner. 2020. "The Fiscal Response to the Covid-19 Crisis in Advanced and Emerging Market Economies." BIS Bulletin, no. 23.

Benmelech, Efraim, and Nitzan Tzur-Ilan. 2020. "The Determinants Of Fiscal and Monetary Policies During The Covid-19 Crisis." National Bureau Of Economic Research, 1050 Massachusetts Avenue Cambridge, MA 02138 July 2020 , Working Paper 27461 Http://Www.Nber.Org/Papers/W27461, 1–43. http://mpoc.org.my/malaysian-palm-oil-industry/.

Chen, Jingjing, Wei Chen, Ernest Liu, Jie Luo, and Zheng Michael Song. 2020. "The Economic Impact of COVID-19 in China : Evidence from City-to-City Truck Flows ∗." 1School OfEconomics and Management, Tsinghua University 2Department OfEconomics, The Chinese University OfHong Kong 3Department OfEconomics, Princeton University 4School OfInternational Trade and Economics, University OfInternational Business and Economic.

Cirrincione, Luigi, Fulvio Plescia, Caterina Ledda, Venerando Rapisarda, Daniela Martorana, Raluca Emilia Moldovan, Kelly Theodoridou, and Emanuele Cannizzaro. 2020. "COVID-19 Pandemic: Prevention and Protection Measures to Be Adopted at the Workplace." Sustainability (Switzerland) 12 (9): 1–18. doi:10.3390/SU12093603.

Hu, Xinyi, Antoine Flahault, Alexander Temerev, and Liudmila Rozanova. 2021. "The Progression of Covid-19 and the Government Response in China." International Journal of Environmental Research and Public Health 18 (6): 1–15. doi:10.3390/ijerph18063002.

Islam, Md. Monirul, Arifa Jannat, Dewan Abdullah Al Rafi, and Kentaka Aruga. 2020. "Potential Economic Impacts of the COVID-19 Pandemic on South Asian Economies: A Review." World 1 (3): 283–99. doi:10.3390/world1030020.

Jackson, James, Martin Weiss, Andres Schwarzenberg, Rebecca Nelson, Karen M. Sutter, and Michael D. Sutherland. 2020. "Global Economic Effects of COVID-19." Congressional Research Service, Informing the Legislative Debate since 1914, Https://Crsreports.Congress.Gov R46270, no. 20: 78. https://crsreports.congress.gov.

Kumar, Dharmendra, Rishabha Malviya, and Pramod Sharma. 2020. "Corona Virus: A Review of COVID-19." Eurasian Journal of Medicine and Oncology,DOI: 10.14744/Ejmo.2020.51418 EJMO 2020;4(1):8–25, no. March. doi:10.14744/ejmo.2020.51418.

Liu, Wei, Xiao Guang Yue, and Paul B. Tchounwou. 2020. "Response to the Covid-19 Epidemic: The Chinese Experience and Implications for Other Countries." International Journal of Environmental Research and Public Health 17 (7): 1–6. doi:10.3390/IJERPH17072304.

Loayza, Norman, and Steven Michael Pennings. 2020. "Macroeconomic Policy in the Time of COVID-19 : A Primer for Developing Countries." World Bank Research and Policy Briefs, no. 147291.

Maliszewska, Maryla, Aaditya Mattoo, and Dominique Van Der Mensbrugghe. 2020. "The Potential Impact of COVID-19 on GDP and Trade : A Preliminary Assessment." World Bank Policy Research Working Paper, no. 9211.

Parikh, Priyanka A, Binoy V Shah, Ajay G Phatak, Amruta C Vadnerkar, Shraddha Uttekar, Naveen Thacker, and Somashekhar M Nimbalkar. 2020. "COVID-19 Pandemic: Knowledge and Perceptions of the Public and Healthcare Professionals." Cureus 12 (5). doi:10.7759/cureus.8144.

Qian, Yue, and Wen Fan. 2020. "Who Loses Income during the COVID-19 Outbreak? Evidence from China." Research in Social Stratification and Mobility 68 (June). Elsevier: 100522. doi:10.1016/j.rssm.2020.100522.

Tan, Ting Wan, Han Ling Tan, Man Na Chang, Wen Shu Lin, and Chih Ming Chang. 2021. "Effectiveness of Epidemic Preventive Policies and Hospital Strategies in Combating Covid-19 Outbreak in Taiwan." International Journal of Environmental Research and Public Health 18 (7): 1–19. doi:10.3390/ijerph18073456.

Tanjangco, Beatrice, Yue Cao, Rebecca Nadin, and Olena Borodyna. 2020. "Pulse 1 : Covid-19 and Economic Crisis – China ' s Recovery and International Response." ODI Economic Pulse Series, China's Outward Investment and Covid-19: Emerging Trends For Developing Countries, no. November: 1–42.

UNDP. 2020. "Assessment Report on Impact of COVID-19 Pandemic on Chinese Enterprises." United Nations Development Programme in China, April 2020, no. April: 1–66. https://www.cn.undp.org/content/china/en/home/library/crisis_prevention_and_recovery/assessment-report-on-impact-of-covid-19-pandemic-on-chinese-ente.html.