World Equity Markets and COVID-19: Immediate Response and Recovery Prospects

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8 June 2020

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Ünal Seven
Central Bank of
the Republic of Turkey

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Studies and Research Center

June 17, 2020

Abstract

Following the spread of the COVID-19 pandemic, most global equity markets experienced significant falls. Recognizing the severe economic impacts of the pandemic, from mid-March, many governments announced unprecedented economic rescue packages, which appear to restore investors' confidence, given the recoveries in most stock markets. However, the recovery performance significantly varies across countries. This paper provides an empirical analysis of how much of the recovery performance observed in equity markets can be explained by the size and types of rescue packages declared by countries. We find that among different types, fiscal stimulus supports seem to be a stronger predictor of equity market recovery performance. We also find that the severity of the outbreak, reliance more on natural resource and tourism revenues are negatively correlated with countries' stock market recovery performance.

Keywords: COVID-19, Stock Markets, Stimulus Packages, Recovery

JEL Classifications: G15, G18

*The views in this paper are solely the responsibilities of the authors and should not be interpreted as reflecting the view of their affiliated institutions.

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1 Introduction

The COVID-19 pandemic, initially broke out in China in early January, has since posed a severe threat to our lives and economies. Millions of infections and hundreds of thousands of deaths have been recorded globally, with more casualties expected in the coming days and months. In response, many countries have had to halt daily life and suspended most international travel. The measures[1] taken to limit the spread of COVID-19 have hit all economies. While the actual macroeconomic impacts of the pandemic will be realized over time, its impact on financial markets was much faster, and dramatic.[2] Most major global equity markets had experienced significant falls up to 50%. Recognizing the short and long-run economic impacts of COVID-19, many governments announced multi-trillion US Dollars economic rescue packages since mid-March. Following this positive signal, global equity markets started to rebound with gradual recovery. However, the recovery performance appears to vary across countries significantly. This paper aims to shed light on explaining these differences in markets' recovery performance.

Using daily data on global equity markets, Google search statistics, and the announcement of economic rescue packages, we first identify the key dates (e.g., peaks and dips) for 78 equity markets in the world. Most world equity markets seem to have reached their peaks around February 19, around the early days of the pandemic spreading to Europe, and have reached their dips around March 23, when many developed economies, including the US and the European countries, started to declare rescue packages. Using these dates, we compute the loss rate, the percentage difference between the peak and dip values of the benchmark indices, and the recovery rate, percentage of loss that has been recovered until the end of April. We then conduct a cross-country empirical analysis on explaining the differences in the loss and recovery rates using country-level COVID-19 bailout data, collected by the IMF COVID-19 Policy Tracker, pandemic related demographics (e.g., the median age of the population, pandemic related deaths, hospital beds), average income and countries' reliance on natural resource, tourism and export revenues.

Our results concerning the loss rates across countries imply that countries with higher pandemic related deaths and/or median age of the domestic population experienced more substantial stock market losses. This finding is not surprising given that in the early days of the pandemic, uncertainty was unprecedented, while the pandemic related cases and deaths seemed to be the only and timely available information to investors. Our results on the recovery rate show that not all types of rescue packages are effective in restoring investors' valuation of equity markets. In particular, fiscal stimulus policies, among others (e.g., easing financial market regulations, rate cuts, etc.,) seem to be strongly related to higher recovery in the equity markets. One interpretation of this result can be that investors have more cogent believes for direct liquidity injections to listed firms (via fiscal policy) may more effectively mitigate the adverse effects of the pandemic than providing indirect supports. We also find that higher pandemic

[1] Hale et al. (2020) introduced a stringency index to combine measures and describe variation in government responses in various areas.

[2] Zhang et al. (2020) showed that risks associated to the pandemic caused to higher volatility in global financial markets.

related deaths, more considerable reliance on tourism and/or on natural resource revenues are statistically significantly but negatively associated with the recovery rate. As the pandemic related risks (e.g., more pandemic related deaths) increase uncertainty and thus, market volatility, it weakens the future value of markets. Our results regarding the tourism and natural resource revenues are in line with the general expectations noted in the recent reports of many international institutions. For instance, according to the OECD (2020), the pandemic related concerns could decrease the global tourism economy by 45-70% in 2020; similarly, commodity markets lost significant value, creating considerable worries on the future of resource-rich economies, especially the commodity-dependent emerging and developing economies, which are listed among the most vulnerable economies to COVID-19 (UN, 2020; World Bank, 2020). Despite the concerns on the disruption of the COVID-19 on global value chains (WTO, 2020), we did not find a statistically significant relationship between countries' export revenues and their stock market recovery performance.

Our results complement the recent papers on the immediate impact of COVID-19 on financial markets. These papers mostly focus on market volatility due to the initial panic in markets in the early days of the pandemic (e.g., Zhang et al., 2020). More recent pieces also provide initial recovery responses in terms of reduction in volatility (e.g., Zaremba et al., 2020) or from local stock market returns (e.g., Al-Awadhi et al., 2020). Moreover, our study provides empirical evidence from a broader cross-country sample with a direct focus on the second stage of the COVID-19 crisis, where more questions on recovery prospects are raised.

We should also note that this paper does not claim any causal interpretation, such that our regression results may suffer from endogeneity and omitted variable bias problems. Despite these limitations, our study provides valuable discussions on understanding the immediate impact of the pandemic on financial markets and how the policy responses may restore investors' confidence in markets. Such an assessment is also useful to infer the possible paths forward out of the COVID-19 crisis.

The next section presents the details of our data and also discusses the economic timeline of the pandemic. Section 3 presents our econometric results. Finally, Section 4 concludes.

2 Data

Our main data, benchmark equity market indices of 78 countries, is collected from Bloomberg.[3] The data is daily and covers the period of January 1 - April 24, 2020. It contains all the major economies from all the regions of the world. Using this data and Google search statistics, we identify the reference dates for when most of the markets have peaked and then, recorded dips.

[3]Very small islands, countries without a equity market or a benchmark index, equity markets that were closed during the pandemic period or related data not provided by Bloomberg are excluded from the study. We also could not include some countries due to lack of data availability on other variables used in the analysis. Given these data limitations, we are left with 78 countries. A full list of countries, covered in our study, can be found in Table A.1 in the Appendix.

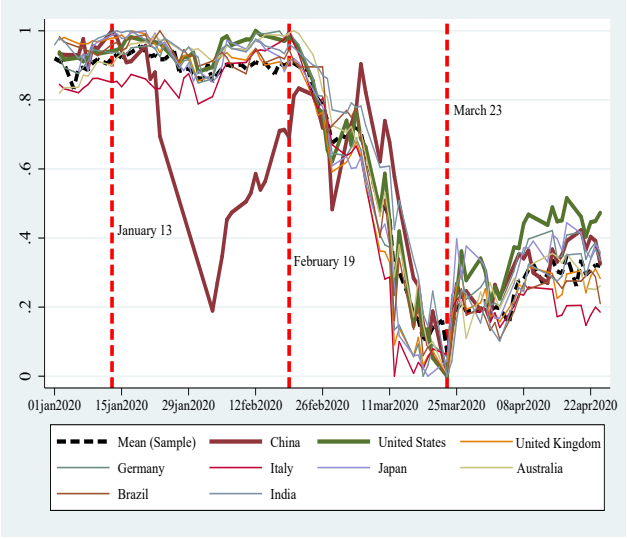
We use the peak and dip dates to measure the impact of the COVID-19 on equity markets (i.e., the loss rate), as well as, the portion of the loss that had been recovered (i.e., the recovery rate) until the end of April. We explain computation process step-by-step below.

How did COVID-19 Spread Over the World Stock Markets?

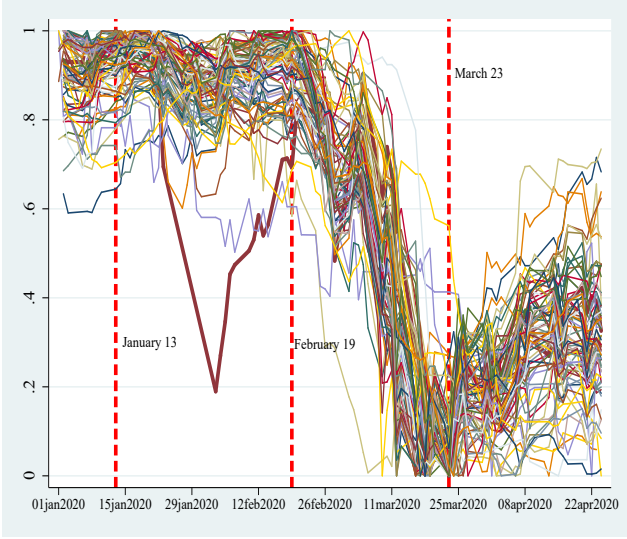
Figure 1 presents the market indices, which we normalized to be between zero and one.[4] In Figure 1a, we present a selection of countries from different continents to show the performance of world stock markets over the first four months of 2020. Three key dates – January 13, February 19 and March 23 – flash out from the figure. The first date shows the date that China's SSE peaked. The second date shows the peak for most of the countries in the rest of the world, and finally, the third date is the beginning of recovery process. We show the performance of all the equity market benchmark indices in our full sample during these dates in Figure 1b. The general tendency appears to be preserved in the full sample.

Figure 1: Stock Exchange Performances (Normalized)

a) Major Stock Exchange Indices



b) All Stock Exchange Indices



Source: Bloomberg.
Note: All indexes are normalized to [0,1] interval.

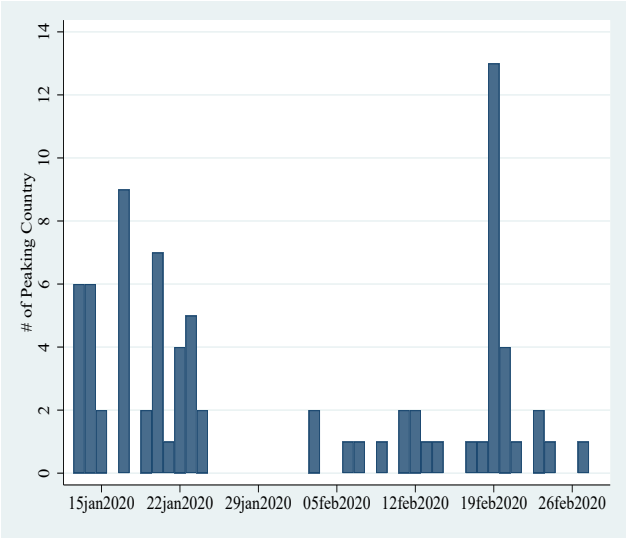
In Figures 2a and 2b, we show the number of countries peaked in January and February, and recorded dips in March. According to the first figure, some moderate number of countries, including Asian countries surrounding China and major oil exporters, reached to their peaks around the same time with China, while many more countries in the rest of the world peaked around February 19. Finally, most countries (63 % of our sample) reached to their dips between March 18 and 23.

The timeline implied by the performance of world equity markets seem to be closely inline

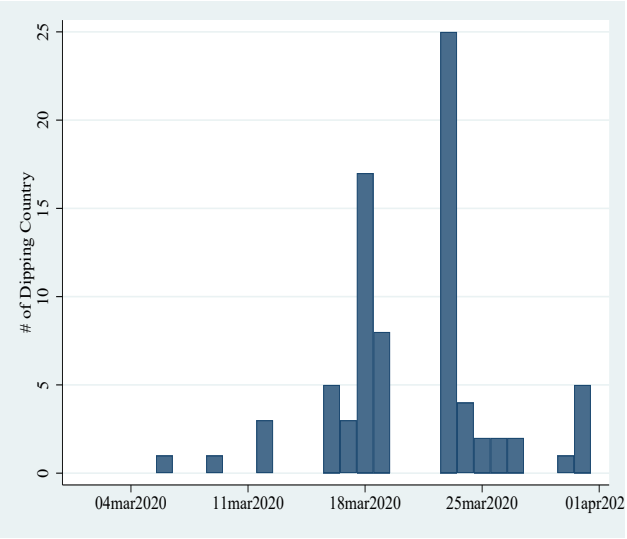
[4]The normalization is done by [x-min(x)]/[min(x)-max(x)], where x is index value.

Figure 2: Identifying Stock Markets' Peaks and Dips

a) Number of Country Peaks Over Time



b) Number of Country Dips Over Time



Source: Authors' calculations from the Bloomberg data.

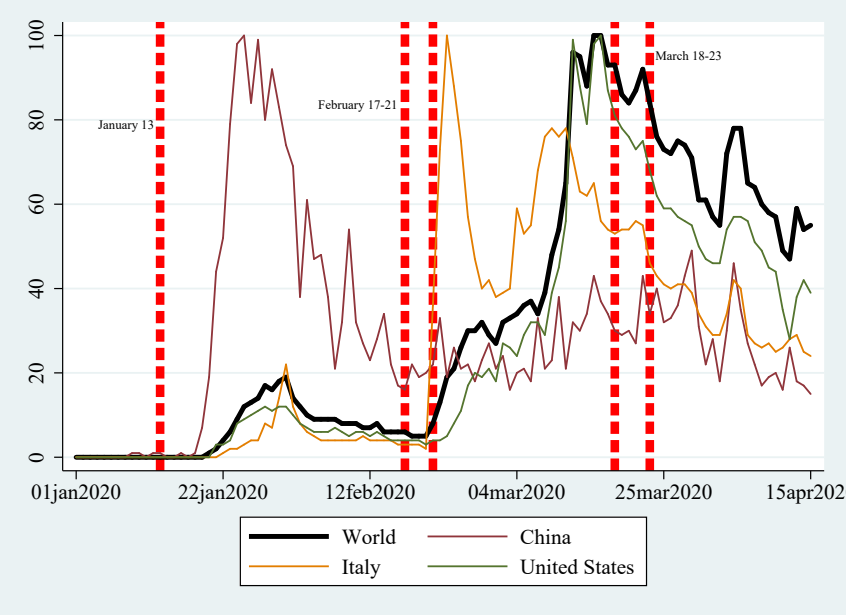
with Google search statistics for the keyword "coronavirus" in the world and in major countries. In Figure 3, we show Google search statistics for the World and China (i.e., the origin of the pandemic), Italy (i.e., the first infected in Europe), and finally, the United States (i.e., a major economy). It is interesting to see that in the early day of the pandemic, there was little interest on the issue in the world, perhaps due to the assumption that the pandemic would be preserved locally. However, the interest on the pandemic quickly picked up around the same time that the virus spread to Italy and then, the world equity markets responded immediately. As we reached to mid-March, the interest started to declining.

To fight the negative economic impact of COVID-19, many governments started to announce unprecedented economic rescue packages since mid-March.[5] According to the IMF COVID-19 Policy Tracker data[6], some of the most significant ones include a 2 trillion stimulus package in the United States (U.S.) (10% of its GDP) and a 0.8 trillion package in Germany (20.5 % of its GDP). The giant rescue packages appear to restore investor confidence, given that the markets started pick up since March 23. With this background, we treat February 17–21, as the global peak, and March 18-23, as the global dip, and use these dates to compute the loss rates, and the recovery rates until the end of April for all the countries in our sample.

[5]Most of these packages were first communicated with the public usually a few days before the actual legal process in respective parliaments and congresses. For instance, the initial Coronavirus Aid, Relief, and Economic Security Act in the United States was designed to be 1.4 trillion USD, which did not pass the Senate in March 23. The revised bill with 2 trillion USD passed in March 25. However, global markets were already informed about the bailout earlier. For the full story, see the Washington Post article.

[6]The IMF produces an up-to-date policy tracker database that summarizes government responses against the human and economic impact of the pandemic for 193 economies, see the IMF Policy Tracker Database.

Figure 3: Google Search on Coronavirus



Source: Google search statistics for the keyword "coronavirus" in the world and in major countries.

Measuring the Stock Market Loss due to COVID-19

In computing the loss rate, we take the maximum index value in the global peak days to determine each market's peak and similarly, take the minimum index value in the global dip days to determine each market's dip. Using the percentage difference between dip and peak values, we measure the loss rate for each country as the immediate impact of the the COVID-19 on their equity markets. Figure 4 displays the computed loss rate for each country in our sample. The figure shows that the pandemic crashed world equity markets up to 50% in some countries. Austrian ATX Prime index dropped for 48%, Italian MIB index declined for 41%, German DAX index fell for 39%, US Dow Jones dropped for 37%, and the UK FTSE100 index was down for 33%.

Measuring the Stock Market Recovery Rate

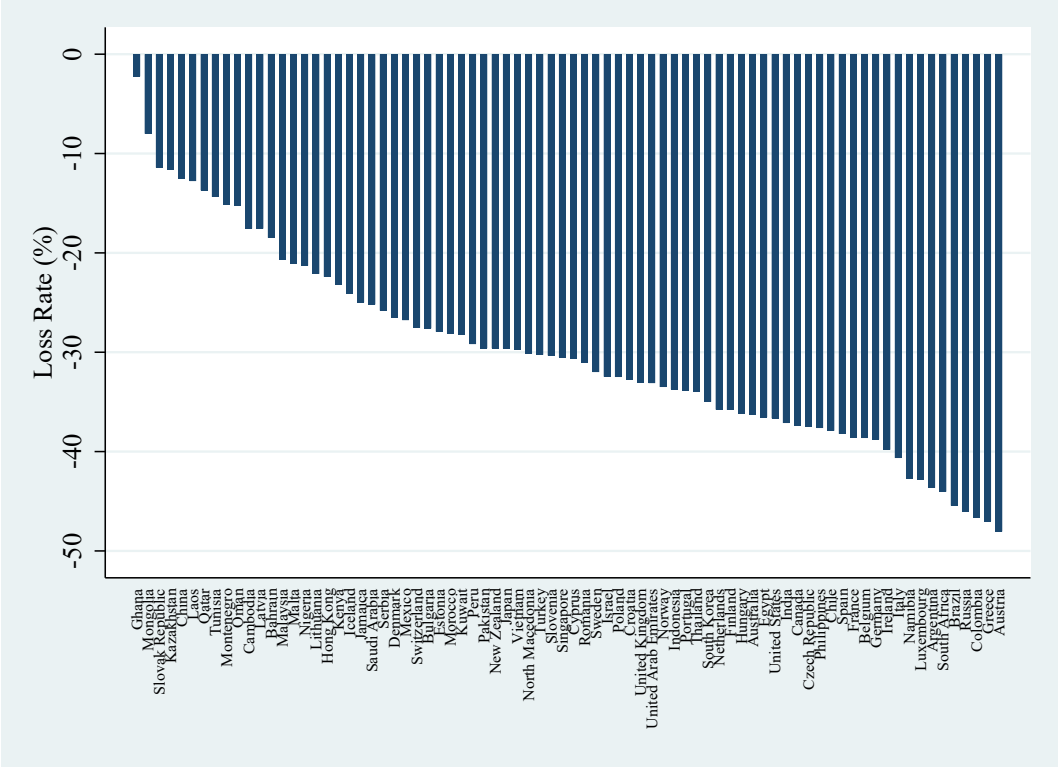
We measure the recovery rate for a equity market benchmark index (*index*) as the ratio of the recovered amount (from its dip to April 24, the last data in our sample) to the loss amount, between the peak and dip dates.

$$recovery\ rate = \frac{index_{(last)} - index_{(dip)}}{index_{(dip)} - index_{(peak)}} \tag{1}$$

For convenience, we multiple the denominator with negative one to make the loss rate positive for every index.[7] Hence, the recovery is a positive number, when there is actually a positive recovery; zero, if no recovery observed, and negative, if further losses accrued. Despite the

[7] All the equity market indices in our sample recorded losses during this time and thus, shows positive numbers once multiplied by negative one.

Figure 4: Loss Rate Between the Peak and Dip



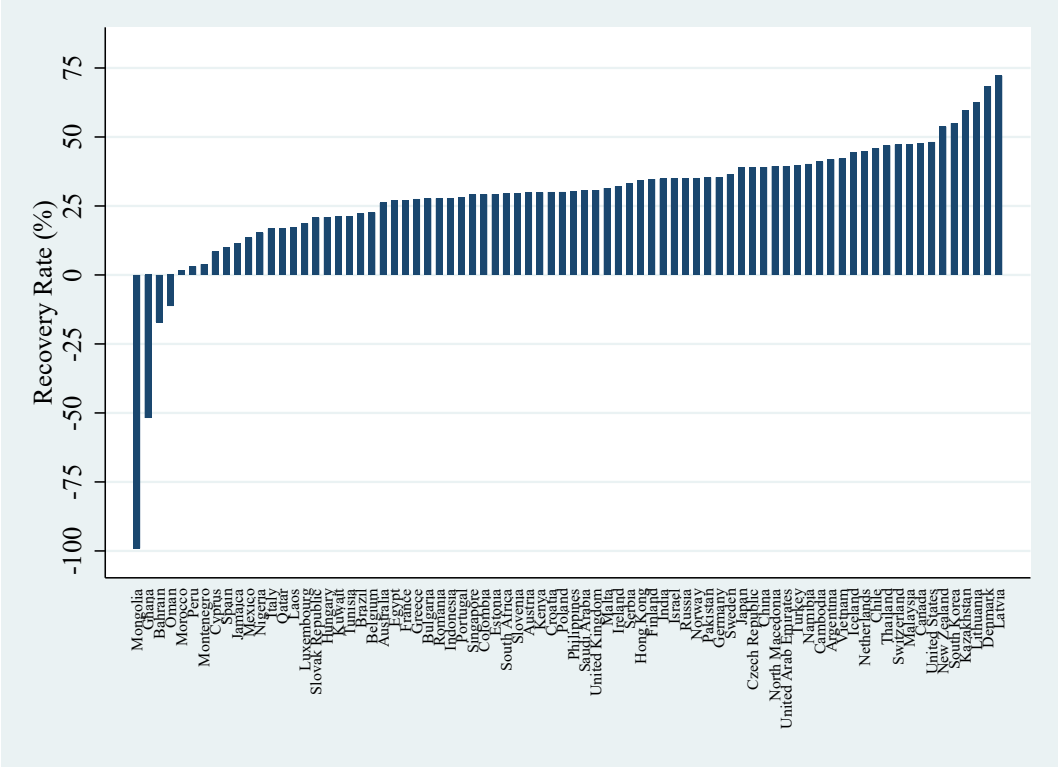
Source: Authors' calculations from the Bloomberg data.
Note: Loss rate is computed as the percentage change between dip and peak values of each index.

growing concerns of a potential second wave of the pandemic, following the stimulus policies, equity markets have made significant recoveries since their dips. As of the last day in our sample, the US Dow Jones had recovered 48% of the losses it incurred between February 19 and March 23. During the same period, the German DAX index recovered 35%, and the UK FTSE 100 regained 31% of their losses.

COVID-19 Rescue Measures and Other Variables

Using the IMF COVID-19 Policy Tracker data, Elgin et al. (2020) created a COVID-19 Economic Stimulus Index (CESI) that we use to measure the size of rescue packages in the analysis. The rescue packages contain various types of supports for households, firms, and the financial industry. Fiscal supports usually occupy the biggest portion in packages, which include direct cash transfers (e.g., enhanced employment benefits, improved food safety, etc.), tax rebates (to individuals and firms), credit guarantees (i.e., preventing firm bankruptcies), forgiving loans (i.e., usually for small and medium size enterprises). Monetary and macro-financial supports usually include easing market liquidity with policy rate cuts and relaxing regulations and supervision controls, as well as asset purchase programs by the central banks. We use both the composite index and its components in our analysis. The summary statistics for all the variables used in our analysis are presented in Table 1 and their cross-correlations are shown in the Appendix, Table A.2.

Figure 5: Recovery Rate from the Dip



Source: Authors' calculations from the Bloomberg data.
Note: Recovery rate is computed as the ratio of the recovered amount from the dip of each index to its value on April 24 to the loss amount between the peak and dip dates.

3 Empirical Analysis

In this section, we present two sets of results. The first set shows our findings on what may explain the cross-country differences in their loss rates and the second set displays our results on explaining the cross-country differences in their recovery rates.

3.1 What Explains the Cross Country Differences in Loss Rates?

We first provide scatter plots for certain country characteristics and the loss rate. Panel (a) of the Figure 6 shows the cross country relationship between the total number of COVID-19 related deaths (up to March 24, 2020)[8] and the loss rate. Strong positive relationship between the two variables is evident. We observe a similar relationship between GDP per capita and the loss rate, which could be somewhat surprising. However, we should note that most advanced economies implemented more strict policies (e.g., social distancing, shutdowns, etc.) to prevent the spread of the pandemic. This could explain the strong positive correlation between the two variables such that tighter measures may imply weakening of firms' future profits from the perspective of investors.

We then conduct simple cross country OLS regressions with the loss rate as our dependent

[8]We take the total number of pandemic related deaths up to March 24, 2020 since we consider the period of March 18-23 as the global dip for equity markets.

Table 1: Summary Statistics

The table presents the summary statistics for all the variables used in the analysis. Loss rate is computed as the percentage change between dip and peak values of each index while recovery rate is computed as the ratio of the recovered amount from the dip of each index to its value on April 24 to the loss amount between the peak and dip dates. Median age is the median age of the population for the year 2019. Hospital beds is the number of hospital beds per 1000 people. The CESI index is a composite index for measuring the combined impact of all adopted policies against the economic impact of the COVID-19 pandemic measures as defined by Elgin et al. (2020), and it is normalized to [0, 1] interval. Fiscal stands for the fiscal policy package as a percent of GDP, Rate Cut is the interest rate cut as a percent of the pre-crisis level, Macro-Financial is the monetary stimulus package as a percent of GDP, BoP is the monetary intervention to control the balance of payments and the exchange rate as a percent of GDP and finally, Other BoP is a dummy variable taking the value of 1 if there are other accompanying measures towards stabilizing BoP and exchange rate a lâ Elgin et al. (2020). Resource rich takes value of 1 for resource rich countries, zero otherwise. Tourism revenue represents the international tourism receipts as a percentage of GDP while total exports variable is defined as the ratio of total exports of goods and services to GDP. Finally, population is the total number of people.

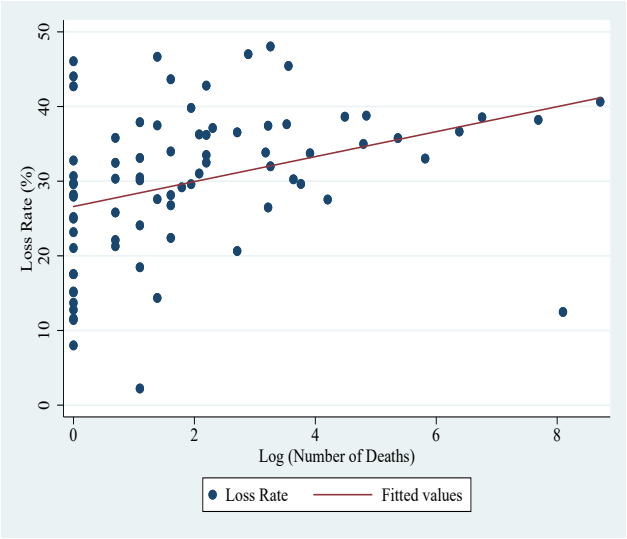
Variable	Obs	Mean	Std. Dev.	Min	Max
Loss Rate (%)	78	29.95	10.02	2.23	48.05
Recovery Rate (%)	78	28.46	23.35	-99.07	72.18
Median Age	78	36.54	7.40	18	48
Death Rate (per 1,000,000 people)	78	3.16	12.61	0	100.56
GDP per capita (000 USD)	78	26.16	23.89	1.20	110.74
Hospital Beds (per 1,000 people)	78	3.81	2.49	0.50	13.40
CESI Index	78	0.37	0.27	0	1
Fiscal (% of GDP)	78	6.01	5.34	-5	22.14
Rate Cut (%)	78	22.42	32.16	-105.56	100
Reserve Requirement and Buffer (%)	78	25.05	34.76	-8.33	100
Macro-Financial (% of GDP)	78	5.07	6.38	0	28
BoP (% of GDP)	78	0.26	0.98	0	6.50
Other BoP	78	0.26	0.44	0	1
Resource Rich Dummy	78	0.22	0.42	0	1
Tourism Revenue (% of GDP)	78	4.93	4.89	0.27	22.89
Total Exports (% of GDP)	78	52.57	39.02	8.24	223.08
Population	78	76300000	221000000	353574	1390000000

variable. We control for the main factors that could explain the cross country differences in loss rates, including, median age of the population, death rate (per a million population), GDP per capita and number of hospital beds. In doing so, we aim to control for the pandemic related demographic, income and health system capacity related differences across countries, which was pretty much the only data available to investors in the early days of the outbreak.

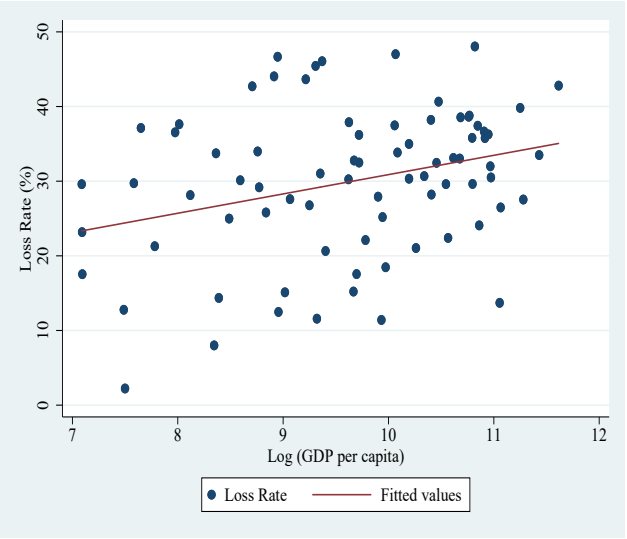
Table 2 presents our results for the loss rate specification. The results show statistically significant and positive correlation between the loss rate and median age of population, pandemic related death rate, and the GDP per capita. Median age only becomes statistically insignificant in the last column with almost no change on sign and magnitude. Pandemic related death rate remains to be statistically significant across the table. Hospital beds (per 1,000 people), as a proxy for the health system capacity to fight the pandemic, is not statistically significant. However, its sign is expectedly negative, implying a negative relation with the loss rate. These results imply that countries with relatively older populations and higher pandemic related death rates experienced a larger immediate drop in their equity markets, following the spread of the virus to Europe. The results are not surprising, given that there was considerable uncertainty in the early days of the pandemic, and investors did not have much other information to evaluate

Figure 6: Loss Rate, Number of Deaths and GDP per capita

a) Loss Rate and Number of Deaths



b) Loss Rate and GDP per capita



Note: Number of deaths represents the total number of COVID-19 related deaths till March 24, 2020. Loss rate is computed as the percentage change between dip and peak values of each index.

the impact of the pandemic on markets. As pointed out earlier, observing a higher loss in richer countries may be due to the fact that richer countries took faster action in halting the daily life.

Table 2: Cross-Country Regression on the Loss Rate

*The table presents the cross-country OLS results for the regression between the loss rate and certain country characteristics. The dependent variable, loss rate, is computed as the percentage change between dip and peak values of each equity market index. Median age represents the median age of the population in 2019. Death rate is the ratio (per 1 million people) of total number of COVID-19 related deaths till March 24 to population. Hospital beds is the total number of hospital beds per 1,000 people. Robust (clustered) standard errors in parentheses. The clustering is done at the World Bank eight region level. *** p<0.01, ** p<0.05, * p<0.1.*

	(1)	(2)	(3)	(4)
Variables	Loss Rate	Loss Rate	Loss Rate	Loss Rate
Median Age	0.367***	0.318**	0.212**	0.223
	(0.104)	(0.095)	(0.074)	(0.125)
Death Rate (per 1,000,000 people)		0.108***	0.101***	0.099***
		(0.017)	(0.019)	(0.027)
GDP per capita (000 USD)			0.068*	0.067*
			(0.034)	(0.035)
Hospital Beds (per 1,000 people)				-0.042
				(0.584)
Constant	16.552***	17.993***	20.101***	19.881***
	(4.473)	(4.201)	(3.972)	(3.862)
Observations	78	78	78	78
R-squared	0.073	0.091	0.110	0.111

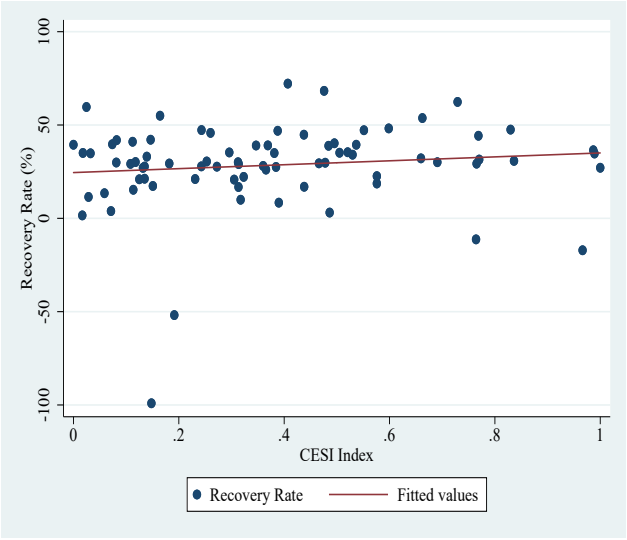
We also tried other controls such as the total health expenditure as a share of GDP and infection rate as the share of infected people in the population. However, the results do not suggest any significant change in the initial conclusion.

3.2 What Explains the Cross-Country Differences in Recovery Rate?

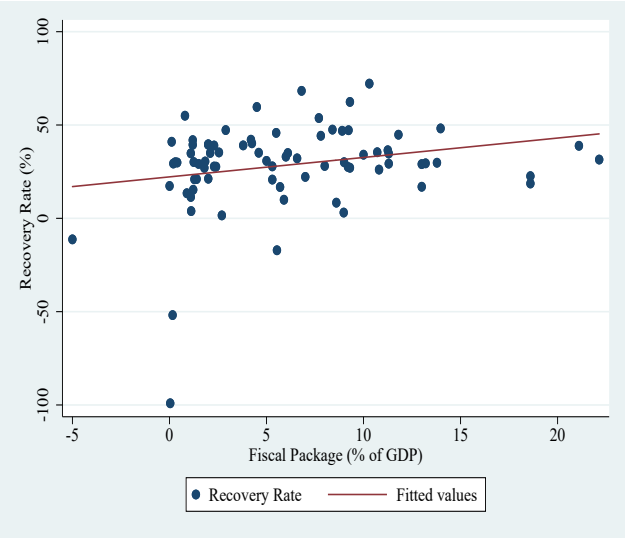
In Figure 7, we show simple correlations between the recovery rate and the Elgin at al. (2020)'s CESI index, as well as its main component, fiscal stimulus packages. The correlation between the variables appears to be positive and notably stronger in the second panel. This result is not surprising since most countries have intensively used fiscal policies. In a way, fiscal stimulus packages are inclusive by design, bringing a more direct impact to all sides of the economy (e.g., households, firms, financial markets). At the same time, CESI's other components, such as macro-finance, the balance of payment, and policy rate cuts, may be more relevant for the general performance of the economy.

Figure 7: Recovery Rate and Stimulus Packages

a) Recovery Rate and CESI Index



b) Recovery Rate and Fiscal Package



Notes: The CESI index is normalized to [0,1] interval. Recovery rate is computed as the ratio of the recovered amount from the dip of each index to its value on April 24 to the loss amount between the peak and dip dates.

As next, we show our results from cross-sectional OLS regressions for the recovery rate in Table 3. Our main variables of interest are the CESI index and its components. We also control for the COVID-19 related death rate given its high explanatory power of the variation in the loss rate. Considering the discussions on the gradual recovery of commodity markets (e.g., particularly oil and gas), expectations on slow recovery of tourism and concerns on supply-chain networks and exports, we also include relevant controls resource richness dummy, tourism, and total export revenues as a percentage of GDP. The results show that there is a positive but statistically insignificant relationship between recovery rate and the CESI index (column 1 of Table 3), and this result does not change when we include other controls. In columns 4, 5, and 6, we replace the main index with its sub-components. Among the six sub-components of CESI index, the fiscal supports and reserve requirement (relaxations) are statistically significantly and positively correlated with the recovery rate. In particular, the coefficient estimate for the fiscal supports is considerably large, indicating an economically stronger relation with the recovery

rate than other sub-components.

Table 3: Cross-Country Regressions on the Recovery Rate

*The table presents the cross-country OLS results for the regression between the recovery rate, the pandemic related death rate, economic stimulus packages and certain country characteristics. The dependent variable, recovery rate, is computed as the ratio of the recovered amount from the dip of each equity market index to its value on April 24 to the loss amount between the peak and dip dates. The CESI index is a composite index for measuring the combined impact of all adopted policies against the economic impact of the COVID-19 pandemic measures as defined by Elgin et al. (2020), and it is normalized to [0, 1] interval. Fiscal stands for the fiscal policy package as a percent of GDP, Rate Cut is the interest rate cut as a percent of the pre-crisis level, Macro-Financial is the monetary stimulus package as a percent of GDP, BoP is the monetary intervention to control the balance of payments and the exchange rate as a percent of GDP and finally, Other BoP is a dummy variable taking the value of 1 if there are other accompanying measures towards stabilizing BoP and exchange rate a lâ Elgin et al. (2020). Death rate is the ratio (per 1 million people) of total number of COVID-19 related deaths till March 24 to population. Resource Rich takes value of 1 for resource rich countries, zero otherwise. Tourism revenue represents the international tourism receipts as a percentage of GDP while total exports variable is defined as the ratio of total exports of goods and services to GDP. Robust (clustered) standard errors in parentheses. The clustering is done at the World Bank eight region level. *** p<0.01, ** p<0.05, * p<0.1.*

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Recovery Rate	Recovery Rate	Recovery Rate	Recovery Rate	Recovery Rate	Recovery Rate
CESI Index	10.52	10.83	6.470			
	(9.327)	(9.534)	(4.641)			
Fiscal (% of GDP)				1.489**	1.489***	1.093***
				(0.585)	(0.378)	(0.162)
Rate Cut (%)				0.0444	0.0420	0.123
				(0.0699)	(0.0967)	(0.138)
Reserve Requirement and Buffer (%)				0.146**	0.145***	0.104**
				(0.0596)	(0.0369)	(0.0358)
Macro-Financial (% of GDP)				-0.567	-0.558	-0.383
				(0.444)	(0.574)	(0.379)
BoP (% of GDP)				-0.671	-0.654	-1.456
				(1.854)	(1.451)	(2.351)
Other BoP				12.43*	12.23	14.18
				(6.848)	(6.642)	(8.047)
Death Rate (per 1,000,000 people)		-0.131*	-0.249***		-0.0449	-0.131**
		(0.0664)	(0.0304)		(0.0773)	(0.0497)
Resource Rich			-23.58**			-24.46*
			(8.388)			(11.91)
Tourism Revenue (% of GDP)			-1.031**			-0.734**
			(0.333)			(0.279)
Exports of Goods and Services (% of GDP)			0.00353			-0.00317
			(0.0309)			(0.0397)
Constant	24.52***	24.81***	36.86***	14.71	14.96	24.75**
	(3.617)	(3.910)	(3.985)	(9.123)	(8.559)	(7.777)
Observations	78	78	78	78	78	78
R-squared	0.014	0.019	0.205	0.148	0.149	0.308

Besides the main results, we also find a negative significant relationship between the COVID-19 related death rate and recovery rate, suggesting higher pandemic related death rates are associated with slower recovery. We also observe statistically significant and negative relation between the recovery rates and countries resource richness, and tourism revenues. This is to say concerns on energy demand and swinging oil and gas prices had a severe impact on the equity market performances of resource rich economies.[9] Similarly, halting daily life and imposing restrictions on international activity also negatively affected the economies that rely more on tourism revenues. Amid discussion on a potential shrink of world trade, export variable does not seem to be statistically significantly related to recovery rate.

[9]For a more detailed discussion on COVID-19 impact on oil and gas exporting economies and different type of green versus traditional assets, see Yilmaz (2020).

4 Discussion and Conclusion

COVID-19, initially broke out in China, first hit human life and the domestic economy in China. The rest of the world remained mostly unaffected until the virus began to spread to Europe. Using daily stock market data, Google search statistics and also the timing of rescue package announcements, we establish reference dates for global peaks and dips in equity market indices of our sample. We then compute the COVID-19 induced loss rates in the world equity markets and also, the market recovery rates following the declaration of rescue packages since mid-March until the end of April.

In a simple regression setup, we analyze the main factors that can explain the cross-country differences in the loss and in the recovery rates. For the first one, we find that the number of pandemic related casualties and population median age are statistically significantly and positively correlated with the loss rate. In the very early days of the pandemic crisis, these were perhaps the only and timely available information to investors despite the unprecedented uncertainty. In the second part of the analysis, we find that fiscal stimulus packages are particularly important to restore expectations. In particular, countries with larger fiscal rescue packages seem to have experienced a stronger recovery. Our findings show that there is a significant negative relationship between the COVID-19 related death rate and recovery rate, suggesting that the evaluation of the pandemic is still associated with investors behavior. We also show that countries with high dependence on natural resources and tourism revenues appear to experience a slowing down in their recovery rates.

We should note that our study provides suggestive evidence from strong correlations without claiming any causal inference. However, the presented results contribute to the discussions on understanding the immediate impact of the pandemic on financial markets and how the policy responses may restore investors' confidence on markets. This may also provide some inference for the prospective recovery of financial markets from the COVID-19 pandemic.

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Appendix

Table A.1: List of Countries Included in the Study

Country	Region	Country	Region
Argentina	Latin America and Caribbean	Luxembourg	Europe and Central Asia
Australia	East Asia and Pacific	Malaysia	East Asia and Pacific
Austria	Europe and Central Asia	Malta	Middle East and North Africa
Bahrain	Middle East and North Africa	Mexico	Latin America and Caribbean
Belgium	Europe and Central Asia	Mongolia	East Asia and Pacific
Brazil	Latin America and Caribbean	Montenegro	Europe and Central Asia
Bulgaria	Europe and Central Asia	Morocco	Middle East and North Africa
Cambodia	East Asia and Pacific	Namibia	Sub-Saharan Africa
Canada	North America	Netherlands	Europe and Central Asia
Chile	Latin America and Caribbean	New Zealand	East Asia and Pacific
China	East Asia and Pacific	Nigeria	Sub-Saharan Africa
Colombia	Latin America and Caribbean	North Macedonia	Europe and Central Asia
Croatia	Europe and Central Asia	Norway	Europe and Central Asia
Cyprus	Europe and Central Asia	Oman	Middle East and North Africa
Czech Republic	Europe and Central Asia	Pakistan	South Asia
Denmark	Europe and Central Asia	Peru	Latin America and Caribbean
Egypt	Middle East and North Africa	Philippines	East Asia and Pacific
Estonia	Europe and Central Asia	Poland	Europe and Central Asia
Finland	Europe and Central Asia	Portugal	Europe and Central Asia
France	Europe and Central Asia	Qatar	Middle East and North Africa
Germany	Europe and Central Asia	Romania	Europe and Central Asia
Ghana	Sub-Saharan Africa	Russia	Europe and Central Asia
Greece	Europe and Central Asia	Saudi Arabia	Middle East and North Africa
Hong Kong	East Asia and Pacific	Serbia	Europe and Central Asia
Hungary	Europe and Central Asia	Singapore	East Asia and Pacific
Iceland	Europe and Central Asia	Slovak Republic	Europe and Central Asia
India	South Asia	Slovenia	Europe and Central Asia
Indonesia	East Asia and Pacific	South Africa	Sub-Saharan Africa
Ireland	Europe and Central Asia	South Korea	East Asia and Pacific
Israel	Middle East and North Africa	Spain	Europe and Central Asia
Italy	Europe and Central Asia	Sweden	Europe and Central Asia
Jamaica	Latin America and Caribbean	Switzerland	Europe and Central Asia
Japan	East Asia and Pacific	Thailand	East Asia and Pacific
Kazakhstan	Europe and Central Asia	Tunisia	Middle East and North Africa
Kenya	Sub-Saharan Africa	Turkey	Europe and Central Asia
Kuwait	Middle East and North Africa	United Arab Emirates	Middle East and North Africa
Laos	South East Asia	United Kingdom	Europe and Central Asia
Latvia	Europe and Central Asia	United States	North America
Lithuania	Europe and Central Asia	Vietnam	East Asia and Pacific

Table A.2: Correlation Coefficients

*The table reports the correlation coefficients for the main variables. Loss rate is computed as the percentage change between dip and peak values of each equity market index. Recovery rate is computed as the ratio of the recovered amount from the dip of each equity market index to its value on April 24 to the loss amount between the peak and dip dates. The CESI index is a composite index for measuring the combined impact of all adopted policies against the economic impact of the COVID-19 pandemic measures as defined by Elgin et al. (2020), and it is normalized to [0, 1] interval. Death rate is the ratio (per 1 million people) of total number of COVID-19 related deaths till March 24 to population. GDP per capita is the real GDP per 1,000 people. Hospital beds is the total number of hospital beds per 1,000 people. Tourism revenue represents the international tourism receipts as a percentage of GDP while total exports variable is defined as the ratio of total exports of goods and services to GDP. * p<0.1.*

	Loss Rate	Recovery Rate	CESI Index	Median Age	Death Rate	GDP per capita	Hospital Beds	Tourism Revenue	Total Exports
Loss Rate	1								
Recovery Rate	0.3375*	1							
CESI Index	0.0958	0.1194	1						
Median Age	0.2709*	0.3104*	0.4125*	1					
Death Rate	0.1981*	-0.0644	0.0512	0.2647*	1				
GDP per capita	0.2633*	0.2069*	0.5804*	0.4956*	0.1811	1			
Hospital Beds	0.1309	0.1481	0.1194	0.6556*	0.0106	0.1991*	1		
Tourism Revenue	-0.2118*	-0.1351	0.0066	0.1257	-0.065	-0.0512	-0.089	1	
Total Exports	-0.078	-0.0004	0.2445*	0.3487*	-0.0134	0.4125*	0.1516	0.3199*	1