COVID-19, Government Policy Responses, and Stock Market Liquidity around the World: A Note

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Abstract

Unprecedented non-pharmaceutical interventions targeted to curb the spread of COVID-19 exerted a dramatic impact on the global economy and financial markets. This study is the first attempt to investigate the influence of these government policy responses on global stock market liquidity. To this end, we examine daily data from 49 countries for the period January-April 2020. We demonstrate that the impact of the interventions is limited in scale and scope. Workplace and school closures deteriorate liquidity in emerging markets, while information campaigns on the novel coronavirus facilitate trading activity.

Keywords: novel coronavirus, COVID-19, stock market liquidity, turnover ratio, non-pharmaceutical interventions, government policy responses, international financial markets.

JEL classifications: G01, G12, G15, G18, H12, H51, I18, Q54.

First draft: 20 April 2020

This version: 31 October 2020

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1. Introduction

Since its discovery in December 2019, the novel coronavirus has rapidly spread all over the globe, infecting more than 17 million people in 213 different countries and territories.[1] The COVID-19 pandemic proved to be a textbook black-swan event, impacting the lives of billions of people. The impact on prices and volatility of financial assets have already been severe (Al-Awadhi et al. 2020; Ashraf 2020; Baker et al. 2020; Goodell and Huynh 2020; Goodell and Goutte 2020; Onali 2020; Ozli and Arun 2020; Zhang, Hu, and Ji 2020), but the true economic impact is yet to come (Correira, Luck, and Verner 2020; Goodell 2020; Nicola et al. 2020; Fernandes 2020; Ozli and Arun 2020).

In an attempt to curb the spread of the disease, governments around the world have taken unprecedented radical steps (Hale, Petherick, and Phillips 2020). Policy responses such as school and workplace closings and restrictions on internal movement aim at constraining social interactions. Since economic activity relies on such interactions, the measures dramatically affected markets and countries around the world. Studies of the governments' non-pharmaceutical interventions pointed to sizable economic and social costs, including unemployment, a decline in wealth, and loss of income (Chen et al. 2011; Epstein et al. 2007; Pike et al. 2014).[2]

[1] Data retrieved from: https://www.worldometers.info/coronavirus/ on 31 July 2020.

[2] On the other hand, Correira, Luck, and Verner (2020) argue that rapid policy responses do not necessarily exacerbate the economic impact of the pandemic itself.

While earlier studies focused primarily on the impact of the policy responses on the economy, the influence on financial markets is largely an unchartered territory. To fill this gap at least partially, this study focuses on one key feature of global markets: liquidity. We aim at answering the question of whether and, if so, how the non-pharmaceutical interventions impact upon liquidity in stock markets.

Equity market liquidity is essential for financial stability and economic growth, especially during extreme events. Importantly, higher liquidity leads to a reduction in the cost of equity capital (Butler, Grullon, and Weston 2005), which can a) alleviate a company's funding constraints, and b) contribute to a company's financial resilience to the coronavirus pandemic. Since liquidity allows the immediate realization of a loss or gain, the importance of exploring its features in such an extreme event cannot be overestimated. Also, liquidity is monitored by a wide range of decision-makers such as portfolio and fund managers, as well as policymakers and regulators who seek to safeguard financial stability amid the coronavirus pandemic. The current unique circumstances provide a fertile soil for investigating the degree to which liquidity changes in response to different government interventions in times of crises.

There are at least three channels of how COVID-19-related policies may impact the stock market liquidity. The first channel could be described as the "infrastructure channel". Workplace closing may disturb decision-making processes in many financial institutions, which disallows swift reactions and quick trading. Some financial institutions may be even physically closed, so—in the case of a lack of proper electronic infrastructure and policy regulations—traders may be unable to conduct transactions. Naturally, the role of these factors would be at least partly diminished if a large part of trading is automated and the economy is digitally advanced; hence, the potential impact may be stronger in emerging markets rather than in developed countries (Glantz and Kissell 2013; Ersan and Ekinci 2016). Notably, even if workplaces are not explicitly closed, other "softer" measures may have an indirect impact. For instance, internal travel restrictions may result in disruptions for commuters, and school closures require parents to stay home, which gives rise to significant absenteeism (Epstein, Hammond, and Lempel 2009; Chen et al. 2011).

The second channel can be described as the "portfolio channel". The policy responses signal changes in the future economic environment, so they may lead to portfolio restructuring. On the one hand, worsening economic conditions may result in changes in cashflow expectations for companies and, thus, portfolio reallocations. On the other hand, investors may be less willing to allocate their money to risky assets, such as stocks. School or workplace closures may signal a deterioration of future household cashflows (Epstein, Hammond, and Lempel 2009; Chen et al. 2011), which increases the risk premium.

Third, investors can be also influenced by behavioral and psychological factors. Galai and Sade (2006), Karlsson et al. (2009), as well as Sicherman et al. (2016), document the "ostrich effect", which implies that investors are reluctant to monitor their portfolios when bad news is likely to come. In other words, investors may prefer to simply "put their head in the sand" rather than trade when confronted with a stream of negative news on government restrictions. This may be also amplified by the "information overload" effect (Agnew and Szykman 2005). This contention underlies the idea that when a problem is loaded with information and thus is too hard to understand, an easy solution is just doing nothing. In addition, Thaler and Johnson (1990) show that individuals who experience several consecutive periods of losses become more loss-averse and avoid taking additional gambles. Pursuant to this line of thinking, trading activity decrease.

However, the combination of an increase in loss aversion and information overload may result in an opposite outcome. Information overload may create a divergence of opinions, which manifests increased activity (Harris and Raviv 1993; Banerjee 2011). Also, the "flight to liquidity" phenomenon (Ben-Rephael 2017) behavior may temporarily increase the trading activity, hence, contributing to liquidity. Consistent with this, Hoffmann et al. (2013) show that trading activity increased during the peak of the Global Financial Crisis of 2008–2009. Also, Yeyati et al. (2008) demonstrate that trading volume increases during financial turmoil.

To study the role of non-pharmaceutical interventions in equity market liquidity, we examine daily stock data from 49 developed and emerging countries during the most recent COVID-19 period that runs from January to April 2020. We consider seven different policy responses: school closures, workplace closures, canceling public events, closing of public transportation, public information campaigns, restrictions on internal movement, and international travel controls.[3] We estimate several different two-way cluster-robust regression models with an array of control variables to evaluate the influence of non-pharmaceutical interventions from the effect of the pandemic and the market crash.

[3] Some governments implemented policies – such as supporting enterprises, employment, and personal incomes – in order to stimulate the economy and protect workers in the workplace (see, e.g., International Labor Organization (2020) for further information). However, due to difficulties in reaching standardized data, which could be reliably quantified, we decided not to include them in the study.

Our main findings could be summarized as follows. We demonstrate that the impact of government interventions is limited in size and scope. The policy responses do not deteriorate liquidity in developed stock markets. Nonetheless, in emerging markets, workplace and school closures lead to a moderate decline in liquidity; specifically, the annual turnover ratio decreases by 10–13%. On the other hand, the COVID-19 information campaigns boost the liquidity measure by about 10%.

From a practical perspective, this study is important for investors, policymakers and regulators to understand the liquidity effects of policy responses to the coronavirus pandemic. Notably, liquidity is factored in investment decisions. Moreover, understanding how government interventions affect market liquidity – which has consequences on an investor's ability to trade – is of utmost importance. During extreme turbulence times it is crucial that the market remains liquid, so investors can easily align and rebalance their portfolios, and execute trading actions as part of their risk management strategies. We also focus on liquidity given its direct and indirect relationship with other key factors such as volatility and expected returns. From the policymaking and regulatory perspective, a low level of market liquidity– which deteriorates the ability to carry out buy and sell transactions – may harm financial stability, and is even more crucial in extremely turbulent periods, such as COVID-19. Therefore, how government policy interventions affect liquidity should be monitored by policymakers and regulators.

The remainder of the article is organized as follows. Section 2 summarizes recent literature studies in the context of COVID-19 and financial markets. Section 3 describes the data and methods. Section 4 presents and discusses the results. Section 5 outlines additional robustness checks. Finally, Section 6 concludes.

2. Literature Review

There is a long and rapidly growing body of studies that deal with the impact of COVID-19 pandemic on financial markets. In fact, several recent papers argue that the impact of the COVID-19 pandemic provoked an economic and financial crisis of unprecedented scale, which dwarfs any former ones (Baker et al. 2020; Spatt 2020; Zhang, Hu, and Ji 2020). These studies, join the rich strand of research that examines the influence of the COVID-19 pandemic on financial markets (Al-Awadhi et al. 2020; Ashraf 2020; Baker et al. 2020; Conlon, Corbet, and McGee 2020; Goodell 2020; Onali 2020; Ozli and Arun 2020; Zhang, Hu, and Ji 2020, Demir et al. 2020).

A careful scrutiny of the literature suggests that COVID-19 effects have been investigated on several close, yet distinct financial market variables. These studies focus on equity markets (Al-Wadhi et al. 2020; Goodell 2020; Li et al. 2020; Pavlyshenko 2020; Sharif, Aloui, and Yaravaya 2020; Topcu and Gulal 2020), commodities such as oil and gold, and alternative assets, such as cryptocurrencies (Bakas and Triantafyllou 2020; Corbet et al. 2020; Umar et al 2020, Umar and Gubareva 2020), the debt market (Arellano et al. 2020; Qiang, Zhang, and Zhao 2020; Sène et al. 2020) and mutual funds (Mirza et al. 2020; Yarovaya et al. 2020).

Additionally, a well-related stream of studies investigates the impact of governments' interventions on financial markets. Ashraf (2020a), for example, find that announcements of government restrictions have a negative impact on international stock market returns, while testing and quarantining policies, and economic support packages result in positive market returns. Phan and Narayan (2020) investigate the impact of government measures of the G7 countries to COVID-19. They find that lockdown measures, travel bans, and economic support positively affect stock markets. Zaremba et al. (2020) investigate the stock market effect of COVID-19 interventions. They find that stringent policy responses increase return volatility in international stock markets. Recently, Zhang, Hu, and Ji (2020) find that policy responses may create further uncertainties in global financial markets, which agrees with the research findings in Pastor and Veronesi (2012). More recently, Hartley and Rebucci (2020) examine the impact of quantitative easing (QE) interventions by 21 central banks on the 10-year government bond yield. They estimate an average market response at -0.14% and -0.28% in developed and emerging economies, respectively.

To summarize, while there is a growing attention in the literature to COVID-19 effects on financial markets and the economy, as well as on the role of government efforts to curb down the adverse effects of the pandemic, we contribute to the existing literature, by presenting a first attempt to investigate the impact of non-pharmaceutical interventions on equity market liquidity. Since liquidity is a financial factor for firms and an important elements of an individual's investments plan, we fill this important gap in the literature.

3. Data and Methods

We base our study on 49 country equity markets classified as developed or emerging by MSCI (see Table 1 for details).[4] To avoid arbitrariness, our study period begins on the first day when the World Health Organization (WHO) was informed about the unknown cluster of pneumonia in Wuhan, China (WHO 2020), so our sample runs from 1 January 2020 to 3 April 2020.[5] We source all the market data from Datastream and calculate the market-related variables (total returns, trading volumes, market capitalizations, and valuation ratios) based on the Datastream Global Equity Indices. These indices represent value-weighted portfolios that cover the majority of tradeable stocks in a market, and are the prime choice in the country-level asset pricing literature (Umutlu 2015, 2019; Zaremba 2019).

We proxy the stock market liquidity with a turnover ratio (Datar et al. 1998), which is available at a daily frequency. Contrary to other popular measures, such as Amihud's (2002) ratio or the number of zero-return days (Lesmond et al. 1999), it does not require backward-looking trailing data, so we can monitor day-to-day changes in liquidity. Furthermore, it could be easily aggregated at the country level even in emerging markets, where timely and reliable data on bid-ask spreads (Chung and Zhang 2014) may be scarce. We calculate the turnover ratio for country i on day t ($TURN_{i,t}$) as the daily trading volume ($V_{i,t}$) expressed in currency terms on all the stocks included in the index over the total market capitalization ($MC_{i,t}$) of the index portfolio:

$$TURN_{i,t} = \frac{V_{i,t}}{MC_{i,t}}. \quad (1)$$

To account for different government policy responses to COVID-19, we rely on data from the Oxford COVID-19 Government Response Tracker.[6] In particular, we use seven different measures of government policies that sought to curb the outbreak of the pandemic: school closing (*PR1*), workplace closing (*PR2*), canceled public events (*PR3*), closed public transport (*PR4*), public information campaigns (*PR5*), restrictions on internal movement (*PR6*), and international travel controls (*PR7*). The measures take positive value if the government launches a particular measure and take on zero otherwise (Hale et al. 2020, downloaded 12 April 2020).[7] In the baseline approach, we consider measures that are applied

[4] Https://www.msci.com/market-classification (accessed 10 April 2020).

[5] More precisely, the WHO received the first notification on 31 December 2019, but this day was a non-trading day around the world.

[6] Https://www.bsg.ox.ac.uk/research/research-projects/coronavirus-government-response-tracker (accessed 10 April 2020).

[7] In case of missing policy variables, we rely on the most recent available observations. Otherwise, we use zero if no previous observation is available.

to an entire country, and not only to targeted regions. Also, the measures used in our study are either formal regulatory ("hard measures") or government recommendations ("soft measures"). Table 1 provides an overview of all the countries included in the sample, along with the number of days when different policies were in place and the average turnover ratio.

[Insert Table 1 about here]

To examine the role of policy responses, we run the following panel regression:

$$TURN_{i,t} = a_i + \gamma_t + \sum_{j=1}^{J} \beta_j PR_{j,i,t} + \sum_{c=1}^{C} \beta_c K_{c,i,t} + \varepsilon_{i,t}, \quad (2)$$

where $PR_{j,i,t}$ denotes the variables representing different policy responses *PR1–PR7* for country i on day t, $K_{c,i,t}$ indicates a set of additional control variables, a_i and γ_t are country and time-fixed effects, $\varepsilon_{i,t}$ is the error term, and β_j and β_c are the regression coefficients. To examine the coefficient significance, we estimate two-way fixed effects cluster-robust standard errors, which are robust to general heteroscedasticity and correlation across markets or across times (Cameron, Gelbach, and Miller 2011; Thompson 2011).

Following the general approach established in earlier studies of stock market liquidity (Scharnowski 2020; Qadan and Aharon 2019; Chordia, Roll, and Subrahmanyam 2001), we add several control variables. Specifically, we control for contemporaneous and lagged market returns (R_t, R_{t-1}), contemporaneous volatility measured as the absolute return on day t ($AbsR_t$), past volatility estimated as the average absolute return through trading days t-1 to t-5 (Vol_{t-1}), market capitalization (MV_{t-1}), market-wide price-to-earnings ratio (PE_{t-1}), and weekday dummies for the day of the week effect. Finally, integrate out the influence of the pandemic from government policies, we control for the total number of coronavirus-related cases and deaths (INF_t, DTH_t) obtained from the European Centre for Disease Prevention and Control.[8] Notably, due to the international nature of our dataset, we are not able to incorporate country-specific variables available only for a few developed markets, such as implied-volatility indices or credit spreads. Table 2 presents the basic statistical properties of the variables in this research.

[Insert Table 2 about here]

Specifically, as we consider all the variables simultaneously, we can isolate the role of non-pharmaceutical interventions from the impact of the coronavirus pandemic or the market crash. Also, many policy measures were implemented simultaneously or within short periods. By considering them jointly, we extract the influence of each type of government action.

[8] Https://www.ecdc.europa.eu/en/publications-data (accessed 10 April 2020).

4. Results

Table 3 reports the results of the panel regressions applied to the full set of countries in the sample. The estimated effects of the majority of the policy responses are insignificant. The only exception is public information campaigns, which exert a positive and significant effect on liquidity. When we control for all the policy responses simultaneously (specification [8]), the ensuing improvement in the daily turnover ratio (expressed in percentage terms) is estimated at 0.027 percentage points (t-stat = 2.36), which is equivalent to approximately 6.7 percentage points on an annualized basis. The impact of the information campaigns could be understood relatively intuitively. Spreading information about COVID-19 development may facilitate the pricing of a negative news about future states of the economy in the stock market. This, in turn, may induce a widespread portfolio repositioning. Also, investors may be prone to rebalance their portfolios towards safe assets. All these may result in additional trading, which enhances stock market liquidity.

[Insert Table 3 about here]

So far, we have performed our tests on the whole sample. In addition, we ask if our research findings hold for developed and emerging markets separately. The premise for this split is the difference in technological advances in financial markets and trading between the two groups. Whereas in the developed markets trading is largely automated and conducted electronically, in some emerging markets such technological infrastructure may be more limited, and the role of proprietary trading may be larger. In consequence, factors such as closing workplaces may affect trading activity more severely.

Table 4 summarizes the impact of government restrictions separately in the developed and emerging markets (classified according to MSCI standards). The dissimilarities are clearly noticeable. In the developed countries, no influence of the policy responses is recorded—none of the coefficients on *PR1* to *PR7* depart markedly from zero. On the other hand, the picture for the developing countries is very different. The effect of information campaigns is even more pronounced, resulting in a 0.04 percentage points (t-stat = 2.89) increase in the turnover ratio per day. Moreover, we also record a negative effect of workplace and school closings. When considered jointly with other measures, these two factors lead to a decline in the market turnover ratio by -0.041 (t-stat = -3.05) and -0.050 percentage points (t-stat = -2.66), respectively. This corresponds with a 10–13% drop in the turnover ratio on an annualized basis.

[Insert Table 4 about here]

The observations on the detrimental effect of the workplace and school closures are in line with our expectations, and they contrast with the positive effect of information campaigns. The workplace closures could lead to challenges in the investment decision-making process and undermine the proprietary trading possibilities, thus damaging market liquidity. The adverse effect of school closures could lead to similar consequences indirectly, via increased work absenteeism (Chen et al. 2011; Viner et al. 2020) or by signaling the forthcoming introduction of stricter measures (Lindzon 2020). It is also important to note that when such interventions were imposed at the beginning of the COVID-19 outbreak, adjustment to the practice and ability of working from home was slow and costly. As indicated above, in emerging economies such an adaptation is constrained by the limited technological infrastructure, and may be slow . Furthermore, school closures may also signal disruptions of future household income, which reduces the incentive to buy risky assets (Epstein, Hammond, and Lempel 2009).

Other phenomena that may explain the negative impact of workplace and school closures, may be due to irrational behavioral motives that are likely to be more pronounced in emerging markets. These motives include the tendency of ignorance of bad news, demonstrated by the "ostrich effect" (Galai and Sade, 2006), the "Information overload" effect (Agnew and Szykman, 2005), the negative effect of bad experience (Thaler and Johnson, 1990), and the disposition effect (Shefrin and Statman, 1985), which refers to the reluctance of investors to realize losses and to holding loser stocks for too long. All these potential behavioral drivers may lead to lower levels of market liquidity.

5. Further Robustness Checks

To assure the reliability of our findings, we perform a battery of robustness tests. First, we experiment with earlier starting points for the study period. Second, we use alternative definitions of the policy response measures. In our baseline approach, we use the recommended and required actions jointly. For example, considering school closures, our binary variable takes the value of 1 when a government either *requires* or *recommends* the closure. Alternatively, in these robustness checks, we take into account only the *required* actions. Third, we modify the selection and construction of the control variables. For instance, we a) discard the weekday dummies or the numbers of COVID-19 infections or deaths, and b) use raw market capitalization instead of its natural logarithm. Fourth, we employ alternative estimation methods including the random-effects model. We also examine the natural logarithm (in lieu of the level) of turnover. Importantly, these checks do not qualitatively change our findings: the information campaigns facilitate market liquidity, while other policies do not exert a reliable impact. For the sake of brevity, these outcomes are not reported in detail, but they are available from the authors upon request.

6. Concluding Remarks

The study examines the influence of government policy responses to the COVID-19 pandemic. Having considered implementations of policy actions in 49 countries, we demonstrate that the effect of policy responses is rather small and limited in scope. Workplace and school closures may limit stock market liquidity, while public information campaigns facilitate additional trading. All these effects, however, are driven solely by emerging markets and play no role in developed countries.

Our study has explicit policy implications. It highlights that governments need to be aware that in addition to a vast detrimental economic impact, the COVID-19-related restrictions may adversely influence the trading environment in financial markets. Specifically, our results should encourage governments to engage in public information campaigns, which are instrumental in greater trading activity and, consequently, a lower cost of capital equity.

The prime limitation of this research is the limited dataset. Longer study periods and the use of richer (e.g., intraday) datasets would enable the employment of alternative liquidity proxies. Future changes and progress in policy responses will allow for the evaluation and verification of our findings. Furthermore, there were possibly some other important phenomena or variables that influenced activity, but we were unable to fully capture them. Increased margin requirements or short-selling restrictions in several developed markets (Unsted 2020) may serve as an example.

Future studies on the issues discussed in this paper could be extended into at least two directions. First, it would be valuable to explore the developments in other asset classes, such as corporate or Treasury bonds. Second, it would be interesting to examine the impact of policy changes during the second wave of coronavirus and its influence on stock market liquidity.

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Table 1. *Countries in the Study*

The table reports the list of countries included in the study. The column headed *TURN* indicates the average daily turnover (multiplied by 100). The columns headed *PR1–PR7* indicate the number of trading days when the particular government policy response was in place: school closing (*PR1*), workplace closing (*PR2*), canceling of public events (*PR3*), closing of public transportation (*PR4*), public information campaigns (*PR5*), restrictions of internal movement (*PR6*), and international travel controls (*PR7*). The study period is from 1 January 2020 to 3 April 2020.

	TURN	PR1	PR2	PR3	PR4	PR5	PR6	PR7
				Developed markets				
Australia	0.41	0	0	5	0	45	0	45
Austria	0.18	16	16	17	16	30	15	20
Belgium	0.20	15	15	19	0	42	12	23
Canada	0.37	11	3	0	0	18	0	52
Denmark	0.27	16	15	21	19	17	0	24
Finland	0.32	2	6	16	0	23	10	13
France	0.29	24	14	4	0	29	13	51
Germany	0.00	15	3	24	0	27	23	26
Greece	0.21	16	0	19	0	27	8	14
Hong Kong	0.27	49	33	49	0	65	39	65
Ireland	0.27	11	20	8	6	0	0	0
Israel	0.25	16	15	22	14	38	14	43
Italy	0.55	21	20	23	11	46	17	52
Japan	0.48	24	28	30	0	41	27	60
the Netherlands	0.39	15	15	17	0	17	14	13
New Zealand	0.14	6	10	15	7	25	7	44
Norway	0.26	16	0	17	0	10	0	15
Portugal	0.30	16	15	0	12	50	12	18
Singapore	0.22	0	0	0	0	66	0	66
South Korea	0.50	30	0	31	0	53	9	45
Spain	0.26	15	0	15	15	45	20	19
Sweden	0.35	0	0	16	0	20	0	12
Switzerland	0.39	16	14	26	0	24	9	16
United Kingdom	0.29	10	14	14	0	42	9	0
United States	0.97	0	0	0	0	14	3	63
				Emerging markets				
Argentina	0.04	12	4	12	5	47	8	15
Brazil	0.57	0	0	0	0	25	0	16
Chile	0.09	15	15	0	0	14	0	13
China	0.62	50	12	0	0	53	0	29
Colombia	0.04	14	28	13	0	28	8	10
Czechia	0.09	17	0	18	10	21	15	20
Egypt	0.10	11	0	12	12	9	12	12
Hungary	0.21	17	5	18	14	24	8	20
India	0.30	11	7	13	9	29	9	47
Indonesia	0.09	15	14	5	0	54	15	56
Malaysia	0.12	15	15	17	0	56	13	47
Mexico	0.11	11	9	5	0	9	8	24
Pakistan	0.08	8	1	7	1	36	1	21
Peru	0.02	0	15	17	0	22	17	21
Philippines	0.05	0	0	0	0	0	0	0
Poland	0.21	16	0	19	0	27	13	20
Qatar	0.05	18	13	20	15	51	11	49
Russia	0.24	10	5	14	0	15	11	45
Saudi Arabia	0.15	20	0	15	11	48	8	15
South Africa	0.34	12	15	15	6	25	15	52
Taiwan	0.33	18	0	19	0	45	0	38
Thailand	0.42	12	0	0	0	21	6	20
Turkey	0.98	15	10	15	12	41	15	51
UAE	0.05	20	5	15	0	10	10	52

Table 2. *Statistical Properties of the Variables Used in the Study*

The table presents the basic statistical properties of the variables used in the study: daily turnover (*TURN*, multiplied by 100), total number of infections in the country (*INF*), total number of deaths (*DTH*), daily market return (*R*), absolute value of return on day *t* (*AbsR*), volatility proxied with the trailing five-day average absolute return (*VOL*), stock market capitalization (*MV*), and stock market P/E ratio (*PE*). *PR*-variables denote dummies representing different government policy measures: school closing (*PR1*), workplace closing (*PR2*), canceling of public events (*PR3*), closing of public transportation (*PR4*), public information campaigns (*PR5*), restrictions of internal movement (*PR6*), and international travel controls (*PR7*). All the statistics are calculated based on the pooled sample of the market-day observations. The study period is from 1 January 2020 to 3 April 2020.

	Mean	Standard deviation	Skewness	Kurtosis	Minimum	First quartile	Median	Third quartile	Maximum
TURN	0.274	0.256	1.874	4.571	0.001	0.099	0.202	0.365	1.902
INF	2485.576	12762.344	7.727	75.034	0.000	0.000	1.000	117.000	216721.000
DTH	103.304	695.653	10.895	148.377	0.000	0.000	0.000	1.000	13157.000
R	-0.004	0.027	-1.120	5.667	-0.174	-0.011	-0.001	0.007	0.122
AbsR	0.017	0.021	2.593	8.431	0.000	0.004	0.009	0.020	0.174
Vol	0.015	0.015	1.694	3.184	0.000	0.005	0.009	0.022	0.107
MV	320.178	269.535	3.329	14.952	66.223	162.384	258.882	387.343	1861.960
PE	14.762	4.593	0.216	-0.221	3.839	11.508	14.637	17.825	28.803
PR1	0.217	0.412	1.376	-0.106	0.000	0.000	0.000	0.000	1.000
PR2	0.133	0.340	2.158	2.659	0.000	0.000	0.000	0.000	1.000
PR3	0.210	0.408	1.421	0.020	0.000	0.000	0.000	0.000	1.000
PR4	0.061	0.239	3.684	11.582	0.000	0.000	0.000	0.000	1.000
PR5	0.474	0.499	0.105	-1.990	0.000	0.000	0.000	1.000	1.000
PR6	0.144	0.351	2.026	2.107	0.000	0.000	0.000	0.000	1.000
PR7	0.464	0.499	0.145	-1.980	0.000	0.000	0.000	1.000	1.000

Table 3. *The Role of Policy Responses for Stock Market Liquidity*

The table reports the estimated two-way cluster-robust (Cameron, Gelbach, and Miller 2011; Thompson 2011) panel regression coefficients (multiplied by 100) for the daily turnover ratio ($TURN_t$) in 49 countries for the period 1 January 2020 to 3 April 2020 (3217 country-day observations in each of the specifications). The independent variables are different policy responses in the country *i* on day *t*—school closing ($PR1_t$), workplace closing ($PR2_t$), canceling of public events ($PR3_t$), closing of public transportation ($PR4_t$), public information campaigns ($PR5_t$), restrictions of internal movement ($PR6_t$), and international travel controls ($PR7_t$)—as well as additional control variables: total number of infections in the country (INF_{t-1}), the total number of deaths (DTH_{t-1}), market returns on days *t* and *t*-1 (R_t, R_{t-1}), absolute value of return on day *t* ($AbsR_t$), volatility proxied with the average absolute return through the trailing five days VOL_{t-1}, stock market capitalization (MV_{t-1}), and stock market P/E ratio (PE_{t-1}). The numbers in brackets are *t*-statistics. All the regression specifications include fixed effects and weekday dummies. *Adj.* R^2 is the adjusted coefficient of determination and *F-stat* denotes the *p*-value associated with the regression *F*-statistic. The asterisks *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$PR1_t$	-0.002							-0.016
	(-1.08)							*(-0.73)*
$PR2_t$		-0.026						-0.020
		(-1.07)						*(-0.75)*
$PR3_t$			0.001					0.015
			(0.05)					*(0.71)*
$PR4_t$				-0.034				-0.026
				(-1.83)				*(-1.11)*
$PR5_t$					0.023*			0.027*
					(2.18)			*(2.36)*
$PR6_t$						-0.017		-0.004
						(-0.82)		*(-0.17)*
$PR7_t$							0.003	-0.006
							(0.22)	*(-0.46)*
INF_t	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.83)	*(0.68)*	*(0.76)*	*(0.63)*	*(0.63)*	*(0.71)*	*(0.81)*	*(0.50)*
DTH_t	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(-1.46)	*(-1.25)*	*(-1.40)*	*(-0.90)*	*(-1.47)*	*(-1.12)*	*(-1.68)*	*(-0.60)*
R_t	-0.789***	-0.798***	-0.791***	-0.790***	-0.747***	-0.779***	-0.788***	-0.730***
	(-4.03)	*(-4.10)*	*(-4.03)*	*(-4.06)*	*(-3.80)*	*(-3.95)*	*(-4.01)*	*(-3.78)*
R_{t-1}	-0.826**	-0.833**	-0.870***	-0.831**	-0.862***	-0.837***	-0.870***	-0.781**
	(-3.11)	*(-3.27)*	*(-3.36)*	*(-3.27)*	*(-3.40)*	*(-3.30)*	*(-3.39)*	*(-3.09)*
$AbsR_t$	1.947***	1.951***	1.982***	1.945***	1.989***	1.980***	1.983***	1.929***
	(6.22)	*(6.41)*	*(6.39)*	*(6.41)*	*(6.49)*	*(6.49)*	*(6.43)*	*(6.27)*
VOL_{t-1}	3.329***	3.285***	3.351***	3.294***	3.296***	3.337***	3.346***	3.233***
	(3.42)	*(3.39)*	*(3.40)*	*(3.32)*	*(3.33)*	*(3.37)*	*(3.38)*	*(3.35)*
MV_{t-1}	0.147	0.195	0.244	0.189	0.297	0.201	0.250	0.190
	(0.55)	*(0.74)*	*(0.90)*	*(0.68)*	*(1.10)*	*(0.73)*	*(0.91)*	*(0.73)*
PE_{t-1}	-0.020*	-0.021*	-0.019*	-0.020*	-0.018*	-0.020*	-0.019*	-0.019*
	(-2.37)	*(-2.45)*	*(-2.32)*	*(-2.46)*	*(-2.29)*	*(-2.42)*	*(-2.36)*	*(-2.31)*
Adj. R^2	0.521	0.521	0.519	0.521	0.521	0.520	0.519	0.525
F-stat	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 4. *Policy Responses and the Stock Market Liquidity in Developed and Emerging Markets*

The table reports the estimated two-way cluster-robust (Cameron, Gelbach, and Miller 2011; Thompson 2011) panel regression coefficients (multiplied by 100) for the daily turnover ratio ($TURN_t$) in 49 countries for the period 1 January 2020 to 3 April 2020 (1650 and 1567 country-day observations for the developed and emerging markets, respectively). The independent variables are different policy responses in place on day *t*: school closing ($PR1_t$), workplace closing ($PR2_t$), canceling of public events ($PR3_t$), closing of public transportation ($PR4_t$), public information campaigns ($PR5_t$), restrictions of internal movement ($PR6_t$), and international travel controls ($PR7_t$). The numbers in brackets are *t*-statistics. All the regression specifications include fixed effects and weekday dummies, as well as additional control variables not reported in the table: total number of infections in the country (INF_{t-1}), the total number of deaths (DTH_{t-1}), market returns on days *t* and *t*-1 (R_t, R_{t-1}), absolute value of return on day *t* ($AbsR_t$), volatility proxied with the average absolute return through the last five days (VOL_{t-1}), stock market capitalization (MV_{t-1}), and stock market P/E ratio (PE_{t-1}). *Adj.* R^2 is the adjusted R^2 coefficient and *F-stat* denotes the *p*-value associated with the regression *F*-statistic. *Panels A* and *B* report the results for developed and emerging markets according to the classification in Table 2. The asterisks *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel A: Developed markets							
$PR1_t$	-0.001							0.012
	(-0.04)							*(0.36)*
$PR2_t$		-0.001						0.008
		(-0.03)						*(0.16)*
$PR3_t$			-0.001					0.004
			(-0.02)					*(0.13)*
$PR4_t$				-0.029				-0.027
				(-1.03)				*(-0.82)*
$PR5_t$					0.013			0.021
					(0.72)			*(1.14)*
$PR6_t$						-0.021		-0.023
						(-0.62)		*(-0.65)*
$PR7_t$							-0.014	-0.020
							(-0.61)	*(-0.89)*
Adj. R^2	0.621	0.621	0.621	0.622	0.621	0.622	0.621	0.623
F-stat	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Panel B: Emerging markets							
$PR1_t$	-0.053**							-0.050**
	(-2.66)							*(-2.66)*
$PR2_t$		-0.043*						-0.041**
		(-2.42)						*(-3.05)*
$PR3_t$			-0.006					0.009
			(-0.29)					*(0.68)*
$PR4_t$				-0.038				-0.029
				(-1.69)				*(-1.42)*
$PR5_t$					0.033**			0.040**
					(2.72)			*(2.89)*
$PR6_t$						-0.010		0.029
						(-0.52)		*(1.87)*
$PR7_t$							0.012	-0.002
							(0.81)	*(-0.18)*
Adj. R^2	0.424	0.418	0.410	0.414	0.418	0.411	0.411	0.623
F-stat	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00