

Relative Stock Market Performance during the Coronavirus Pandemic: Contagion vs. Policy Effects in 80 Countries*

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Abstract

This paper examines relative stock market performance following the onset of the coronavirus pandemic for a sample of 80 stock markets. Weekly data on coronavirus cases and deaths are employed alongside Oxford indices on each nation's stringency and government support intensity. The results are broken down both by month and by geographical region. The full sample results show increased coronavirus cases to exert the expected overall effect of worsening relative stock market performance, but with little consistent impact of rising deaths. There is relatively widespread evidence of adverse stringency effects on relative stock market performance combined with positive reactions to government support in March and December in the overall sample – supplemented by some pervasive effects in mid-2020 evident elsewhere, especially in Latin America.

JEL codes: G15

Keywords: stock markets; coronavirus; government policy

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I can't abandon that [lockdown] tool any more than I would abandon a nuclear deterrent. But it is like a nuclear deterrent, I certainly don't want to use it.

(British Prime Minister Boris Johnson, July 19, 2020)¹

Speculative manias are in the air ... Along with the other economic trends—a strong recovery, surging commodity prices and an uptick in inflation—those asset bubbles have a clear cause: the massive expansion of money and credit.

(Greenwood and Hanke, February 21, 2021)

Introduction

The coronavirus pandemic of 2020 represented the most devastating health crisis since the Spanish Flu of 1918-1919. Although stock markets reacted negatively to the spike in death rates at that time (Burdekin, 2021), far more violent moves were seen in 2020. The record-breaking 33.7% drop in the S&P 500 stock market index between February 19 and March 23, 2020 was accompanied by massive declines in most other major stock markets around the world. This was quickly followed by record GDP declines in the second quarter of 2020 in the United States and many European countries. Nevertheless, most of these same countries then enjoyed a major stock market boom from the March lows in the face of massive central bank liquidity expansion (Burdekin, 2020a).²

The initial US stock market plunge following the onset of the 2020 pandemic greatly outpaced the earlier experience under the Spanish Flu. Even though the Spanish Flu appears to

¹ Quoted in Malnick (2020).

² This is itself consistent with the past experiences considered by Friedman (2005), who links the US stock market recovery from the post-1999 crash to rapid Federal Reserve monetary expansion and contrasts this with the effects of stagnant money supply in post-1989 Japan and monetary contraction in the post-1929 US case.

have been far deadlier (cf, Burdekin, 2020b), the US stock market initially continued to rise following the outbreak and merely fell back to summer 1918 levels after monthly deaths peaked later in the year. There was a sharp rebound afterwards, however, and the Dow Jones Industrial Average gained around 50% from late February 1919 through the end of the year. Pent-up demand following the end of the pandemic may well have been a factor in this outcome (Burdekin, 2020a) – as could prove to be true once again in 2021. Nevertheless, a major difference between the 1918-1919 and 2020-2021 experiences remains the far lesser extent of the lockdowns and government intervention seen during the earlier episode.³ The main goal of this paper is to take these factors into account and to assess US stock market behavior not in isolation but in comparison with relative performance in other world stock markets.

Explaining the 2020 Stock Market Reactions

The enormous market turnaround after March 2020 occurred despite accelerating coronavirus spread around the world, with cases rising in every continent besides Antarctica. Cox, Greenwald and Ludvigson (2020, p. 20) conclude that the stock market rebound was largely driven by shifts in sentiment rather than fundamentals: “We find that the most likely candidate for explaining the market’s volatility during the early months of the pandemic is the pricing of stock market risk, driven by big fluctuations in risk aversion or sentiment unrelated to economic fundamentals or interest rates.” The rise in market volatility actually appears to precede the March shutdowns and travel bans, with Just and Echaust (2020), for example, identifying a shift from a low volatility regime to a high volatility regime in late February 2020.⁴

³ An especially telling fact is Velde’s (2020) observation, that by the January 1919 issue of the *Federal Reserve Bulletin*, the Spanish Flu pandemic was no longer meriting even a mention in the Federal Reserve’s main publication. The contrast with 2021 in this regard could not be more stark.

⁴ The onset of such high volatility regimes can itself produce significant sectoral effects, as seen in Burdekin and

Even though the extreme shifts seen early on may indeed be hard to explain, factors coming into play over time include both the spread of the virus and government reactions to the public health emergency. This includes the massive stimulus measures undertaken in the United States and Europe to provide economic support to individuals and businesses.

Shifts in the level of economic support in either direction could be expected to elicit stock market reactions, with Chan-Lau and Zhao (2020), for example, emphasizing negative stock market reactions in cases where government stimulus was withdrawn when the number of daily COVID-19 cases remained relatively high. There is also the impact of government-ordered lockdowns, however, and Baker et al. (2020) conclude that it was these government restrictions on commercial activity, combined with social distancing, that account for the US stock market reacting so much more forcefully to COVID-19 than to the Spanish Flu (or prior pandemics). Given that stock markets would be expected to react to both stimulus measures *and* lockdowns, this paper provides new comparative evidence on the impact of each assessed over a broad range of world stock markets. The effects of rising coronavirus cases and deaths are also controlled for in the analysis.

The relative importance of the government interventions is assessed in the broadest possible manner by incorporating 80 stock market indices drawn from all corners of the globe (Table 1). This essentially includes every available stock market, except that Venezuela and Zimbabwe were excluded owing to the distortions associated with their respective hyperinflations that predated the pandemic. In assessing how the relative strength of each market varied over 2020 in response to variations in virus conditions and government measures, data on the government measures are drawn from the monthly data series available in Oxford

Tao's (2021) comparative Markov-switching analysis of gold's hedging value in 2020 vs. 2008-2009.

University's "Coronavirus Government Response Tracker" (Hale et al., 2020). The Oxford University data utilizes an ordinal scale reflecting the relative level of economic support and the relative level of stringency. Economic support encompasses income support, debt/contract relief for households, fiscal measures, and provision of international support. Meanwhile, the stringency index collates publicly available information on such policies as school and workplace closures, stay at home restrictions and travel bans to produce an additive score measured on an ordinal scale that varies from 0 to 100 (see Table 2).

We compare relative market performance to each country's relative levels of virus cases, virus deaths, government stringency and economic support. We examine these relationships not only in the aggregate but also on a continent-by-continent basis for each month between March and December 2020. This encompasses the span between the extreme pessimism evident in market reactions early in the pandemic to the greater optimism emerging later on, spurred also by encouraging vaccine news in November and December 2020.

Overview of the Data on Virus Spread and Policy Responses Around the World

In addition to the fluctuations in virus infections and policy responses over time, Table 3 reveals substantial geographical variation in 2020. Table 3 compares summary data on stock market's relative strength indices (market_RSI), increases in cases per 100,000 (g_cases100k), increases in deaths per 100,000 (g_deaths100k), and the Oxford series on the levels of government economic support (econsupport) and stringency measures (stringency) – each measured on scale of 0-100, with zero being lowest and 100 representing maximum intensity. The market_RSI puts each stock market on a scale from 1 to 80, with 1 being the top performer and 80 being the bottom performer. Relative strength is assessed on the basis of the dollar

returns for each market index. Summary statistics over the March-December 2020 period for the full sample of 80 countries (Table 3a) are followed by summary statistics broken down according to the following geographical groupings:

Africa: Botswana, Egypt, Ghana, Kenya, Malawi, Mauritius, Morocco, Nigeria, South Africa, Tunisia and Zambia

Australasia: Australia and New Zealand

East Asia: China, Hong Kong, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan, Thailand and Vietnam

Eastern/Southern Europe: Bulgaria, Croatia, Czech Republic, Cyprus, Estonia, Greece, Hungary, Lithuania, Latvia, Poland, Romania, Russia, Slovakia, Slovenia and Ukraine

Latin America: Argentina, Barbados, Bermuda, Brazil, Chile, Colombia, Jamaica, Mexico, Peru and Trinidad

North America: Canada and United States

South Asia and Middle East: Bahrain, India, Israel, Kazakhstan, Kuwait, Lebanon, Oman, Pakistan, Qatar, Saudi Arabia, Turkey and United Arab Emirates

Western Europe: Austria, Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom

The geographical groupings are primarily done by continent, but with Asia and Europe divided into two parts. In the case of Europe, the separation is between the more established nations of Western Europe and the primarily emerging economies of Eastern and Southern

Europe. Although East Asia covers a range of development levels, all these nations share relative proximity with China and most are members of ASEAN (Association of Southeast Asian Nations). The countries in the South Asia and Middle East group are distinct both in terms of geographical location and by typically having lesser links with China.

The summary data broken down by region in Table 3b through Table 3i show some of the enormous variations in national experiences under the pandemic. For example, North America (Canada and United States) show an average 72.9 increase in cases per hundred thousand and 1.40 deaths per hundred thousand. Even with all these numbers scaled by population, the North America figures are over fifty times greater than the corresponding Australasia values. Cases and deaths in Africa and East Asia are also dramatically lower than in North America, while the other regions represent intermediate cases – but generally closer to the North American levels than Africa, Australasia, and East Asia.

The highest average levels of stringency are seen in Latin America, South Asia and Middle East, North America, and East Asia (in that order). The other regions are all below 50 on a scale of 0-100, with Australasia having the lowest average value of all. However, it should be emphasized that even Australasia's average stringency level of 44.6 is substantial, leaving it within 25% of the highest level of 59.0 registered in Latin America. Interestingly, despite having the lowest virus cases, virus deaths and average stringency levels, Australasia has the highest average level of government economic support (60.1). Western Europe is just behind with 59.4, followed by North America with 59.3 and Eastern and Southern Europe with 59.0. The nations of Africa and Latin America on average offered the least economic support, with index values of 37.9 and 41.6, respectively.

Empirical Analysis

In seeking to explain relative stock market performance following the onset of the pandemic, the relative strength of each market index is regressed on its own lagged value, current and lagged levels of additional cases (per hundred thousand of the population), current and lagged values of additional deaths (per hundred thousand of the population) and that country's Oxford index values for stringency and economic support. Weekly data are employed in the regressions, with the results broken down both by month and by geographical region.⁵ Given that stronger market performance equates to a lower market_RSI value, the expected signs on virus cases and virus deaths is positive insofar as worse virus spread exerts a negative market effect. The expected sign on stringency would also be positive given that negative effects on economic activity should worsen the relative performance of the stock market. Finally, the expected sign on econsupport would be negative if the additional funding boosts relative market performance.

The full sample results in Table 4 show increased cases to exert the expected overall effect of worsening relative stock market performance. This effect is significant at the 95% confidence level or better overall as well as for April, August and October individually. Although there some evidence of an offsetting effect of lagged cases, this may simply reflect the market impact of a rise in cases subsiding over the following month. New deaths are insignificant overall, but are significant and positive in May and August (while significant and

⁵ Stationarity of the variables entered in the regressions is confirmed by application of the Harris-Tzavalis (1999) unit root test. This test is applicable to cases where the number of panels is large relative to the number of time periods. The results reject the presence of a unit root at better than the 98% confidence level or better in each case (Table A.1).

negative in April and September). There are similarly mixed findings for lagged deaths and no clear systematic effect.

Although stringency and econsupport are insignificant overall, stringency has the expected positive and significant effect in March and July. However, the significant negative effect for September suggests a favorable impact on relative market strength later in the year. Meanwhile, econsupport is significant with the expected negative sign in March and December, but significant with the opposite sign in May. With the major first and second waves of the virus in countries like the United States occurring in or around those same March and December months, it may well be that government support was seen as being more critical at those times – and this could explain why there appear to be favorable market reactions in those particular months.

Tables 5 through 10 present results for the individual geographical groupings. Although Australasia and North America were included in the full sample results reported in Table 4, the number of countries in these two groups is insufficient for separate regression analysis. In terms of the overall findings across the different groupings, increased cases are significant with the expected positive sign for East Asia and Western Europe. Increased cases are insignificant overall in all other regions, with mixed significance observed in individual months. New deaths are significant overall only for Western Europe, with a negative sign. This counterintuitive finding seems to primarily derive from a strong effect indicated for July, when deaths were generally trending down, and may simply reflect a failure of markets to recover when the death rate improved. Elsewhere, there are generally very mixed findings across individual months that leaves little clear pattern. However, Africa has four months (March, April, September and December) for which deaths exert significant positive effects, i.e., weakening stock market RSI.

Stringency is significant overall with the expected positive (weakening RSI) effect only for Africa. Although it is otherwise significant overall just for East Asia, and with a negative sign, in terms of individual months it is significant there with the expected positive sign in March and only significant with a negative sign in September. In Eastern and Southern Europe as well as Latin America, stringency is significant with the expected positive sign in June and insignificant for other months. South Asia and Middle East also evinces a significant positive effect of stringency in June, but with offsetting indicated significant negative effects in May and September. Although the findings remain quite mixed, there is a tendency for stringency measures to hurt stock market performance earlier in the pandemic (as seen for March and June 2020).

Finally, economic support is never significant overall and the only clear case of beneficial stock market effects is seen for Latin America. In this region, econsupport is negative and significant in each of May, June and August (while positive and significant in July). Included here is the Brazilian support package of as much as \$10 billion per month, more than for any other developing nation, that helped Brazil's GDP exceed its pre-pandemic January 2020 levels by July – albeit it at the expense of potentially disastrous longer-term fiscal consequences (see Magalhaes and Pearson, 2020). The lack of more consistent overall findings for economic support may reflect the fact that such support is usually applied when times are darkest. If the such support is applied in the face of an already weakening market, it will only appear successful on a statistical basis if it is able to immediately turn this trend around. This will not always be the case, even if these same interventions do help lay the groundwork for subsequent recovery.

Conclusions

The overall results offer some support for growth in coronavirus cases and stringency hurting stock market performance, together with some evidence that 2020 government support measures helped the market both in March and late in the year. However, there is considerable variation across the different geographical regions considered in this paper. Clear-cut adverse effects of new coronavirus cases are found only for East Asia and Western Europe, for example. There is more widespread evidence of adverse effects associated with stringency, in overall terms for Africa and during mid-year in Eastern and Southern Europe, Latin America and South Asia and Middle East. Economic support's favorable effects in March and December in the overall sample are generally not mirrored over the different geographical groupings. However, there are several significant months for the Latin American grouping around mid-2020.

The empirical findings are limited both by the total coverage being only ten months and the impossibility of fully capturing the tumultuous events through the limited array of variables included in the regressions. Nevertheless, markets are seen to generally react to growth in cases in the expected fashion and there is some relatively widespread evidence of adverse stringency effects on relative stock market performance. Although it is possible that positive reactions to government support in March and December in the overall sample may be driven by the US experience, there are also some pervasive effects in mid-2020 evident elsewhere – especially in Latin America. More generally, it is clear that the substantial variation by region would make it unwise to draw too many general conclusions from analysis focused more narrowly on either the United States alone or just more advanced industrial countries. It is hoped that the wide-ranging sample covered in this study can serve as a starting point in unpacking what has driven market performance globally under the coronavirus pandemic.

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TABLE 1: National Stock Market Indices

Rank	Country	Market Index	Index Ticker
1	United States	S&P 500	SPX Index
2	China	Shanghai Composite	SHCOMP Index
3	Japan	Nikkei 225	NKY Index
4	Hong Kong	Hang Seng Index	HIS Index
5	United Kingdom	FTSE 100	UKX Index
6	France	CAC 40	CAC Index
7	Saudi Arabia	Tadawul All Share	SASEIDX
8	Germany	DAX	DAX Index
9	Canada	S&P/TSX Composite	SPTSX Index
10	India	Nifty 50	NSEI
11	Switzerland	SMI	SMI Index
12	South Korea	KOSPI	KOSPI Index
13	Taiwan	Taiwan Weighted Index	TWSE Index
14	Australia	S&P/ASX 200	AS51 Index
15	Sweden	OMX Stockholm 30	OMX Index
16	Netherlands	AEX	AEX Index
17	Brazil	Bovespa	IBOV Index
18	Russia	MOEX Russia	IMOEX Index
19	Spain	IBEX 35	IBEX Index
20	Italy	Italy 40	FTSEMIB Index
21	Denmark	OMX Copenhagen 20	OMXC20CP Index
22	Thailand	SET Index	SET Index
23	Indonesia	Jakarta SE Composite Index	JCI Index
24	Singapore	MSCI Singapore Index	MXSG Index
25	Malaysia	FTSE Malaysia KLCI	FBMKLCI Index
26	Belgium	BEL 20	BFX
27	South Africa	South Africa Top 40	TOP40 Index
28	Mexico	S&P BMV IPC	MEXBOL Index
29	Finland	OMX Helsinki 25	OMXH25GI Index
30	Norway	OSE Benchmark	OSEBX Index
31	Philippine	PSEi Composite	PCOMP Index
32	UAE	DFM General Index	DFMGI Index
33	Vietnam	VN	VNI
34	Turkey	BIST 100	XU100
35	Israel	TA 35	TA-35 Index
36	Chile	S&P CLX IPSA	IPSASD Index
37	Qatar	DSM Index	DSM Index
38	Poland	WIG20	WIG20 Index
39	Austria	ATX	ATX Index

40	New Zealand	NZX 50	NZSE50FG Index
41	Ireland	ISEQ Overall	ISEQ Index
42	Kuwait	Kuwait All-Share Index	KWSEAS Index
43	Colombia	COLCAP	COLCAP Index
44	Peru	S&P Lima General	SPBLPGPP
45	Portugal	PSI 20	PSI20 Index
46	Morocco	MASI Free Float All-Shares Index	MOSENEW Index
47	Egypt	EGX 30	EGX30 Index
48	Pakistan	Karachi 100	KSE100 Index
49	Greece	Athens General Stock Index	ASE Index
50	Argentina	S&P Merval	MERVAL Index
51	Nigeria	NSE 30	NGSE30 Index
52	Hungary	Budapest SE Index	BUX Index
53	Czech Republic	PX	PX Index
54	Romania	BET	BET Index
55	Croatia	CROBEX	CRO Index
56	Kenya	Nairobi SE All-Share Index	NSEASI Index
57	Bahrain	Bahrain Bourse All Share Index	BHSEASI Index
58	Oman	MSM 30	MSI
59	Bulgaria	BSE SOFIX	SOFIX Index
60	Jamaica	JSE Market Index	JMSMX Index
61	Trinidad	TT Market Composite Index	TTCOMP
62	Iceland	OMX ICEX All Share PI	ICEXI Index
63	Slovenia	Blue-Chip SBITOP	SBITOP Index
64	Tunisia	Tunindex	TUSISE Index
65	Kazakhstan	KASE	KZKAK Index
66	Luxembourg	LUXX	LUXXX Index
67	Mauritius	Semdex	SEMDEX Index
68	Lebanon	BLOM Index	BLOM Index
69	Slovakia	SAX	SKSM Index
70	Lithuania	OMX Vilnius Index	VILSE Index
71	Cyprus	Cyprus Main Market	CYSMMAIN
72	Botswana	Botswana Gaborone Index	BGSMDC Index
73	Estonia	Tallinn TR Index	TALSE Index
74	Ghana	Ghana SE Composite Index	GGSECI Index
75	Bermuda	BSX Index	BSX Index
76	Barbados	BSE Market Index	BARBL Index
77	Malawi	Malawi Shares Domestic Index	MWSIDOM Index
78	Ukraine	PFTS	PFTS Index
79	Zambia	Lusaka SE All Share Index	LUSEIDX
80	Latvia	OMX Riga Index	RIGSE Index

TABLE 2: Oxford University Indicators and Basis for Stringency Index

Containment and closure

- C1 School closing
- C2 Workplace closing
- C3 Cancel public events
- C4 Restrictions on gathering size
- C5 Close public transport
- C6 Stay at home requirements
- C7 Restrictions on internal movement
- C8 Restrictions on international travel

Economic response

- E1 Income support
- E2 Debt/contract relief for households
- E3 Fiscal measures
- E4 Giving international support

Health systems

- H1 Public information campaign
- H2 Testing policy
- H3 Contact tracing
- H4 Emergency investment in healthcare
- H5 Investment in Covid-19 vaccines
- H6 Facial coverings
- H7 Vaccination Policy

Overall indices

Index	k	C1	C2	C3	C4	C5	C6	C7	C8	E1	E2	E3	E4	H1	H2	H3	H4	H5	H6	H7	M1	
Government response index	14	x	x	x	x	x	x	x	x	x	x			x	x	x				x	x	
Containment and health index	12	x	x	x	x	x	x	x	x					x	x	x				x	x	
Stringency index	9	x	x	x	x	x	x	x	x					x								
Economic support index	2									x	x											
Legacy stringency index (see end of doc)	7	x	x	>	?	x	?	?	x					x								

Source: Hale et al. (2020, pages 4 and 26)

TABLE 3: Summary Statistics for Full Sample and by Region**a. Full Sample**

	count	mean	sd	min	max
market_RSI	4240	40.5	23.09493	1	80
g_cases100k	4160	41.44165	90.85629	-179.5596	1203.091
g_deaths100k	4160	.7668794	1.798592	-3.2232	18.49932
stringency	4240	51.30944	27.16211	0	100
econsupport	4240	48.98585	34.41286	0	100

b. Africa

	count	mean	sd	min	max
market_RSI	583	42.48885	23.49986	1	80
g_cases100k	572	9.616895	22.52485	0	146.5333
g_deaths100k	572	.2194387	.6140417	0	5.347495
stringency	583	48.40607	28.56593	0	93.52
econsupport	583	37.92882	32.34679	0	100

c. Australasia

	count	mean	Sd	min	max
market_RSI	106	37.76415	21.59345	2	78
g_cases100k	104	1.502934	2.912689	0	13.40398
g_deaths100k	104	.0392611	.100428	-.0039216	.5803949
stringency	106	44.64877	26.9876	0	96.3
econsupport	106	60.14151	32.5555	0	100

d. East Asia

	count	mean	sd	min	max
market_RSI	583	39.4837	21.63178	1	80
g_cases100k	572	4.373834	11.17784	0	120.0784
g_deaths100k	572	.0442898	.0892606	0	.6588728
stringency	583	50.63443	23.04173	0	100
econsupport	583	46.93396	34.95796	0	100

e. Eastern and Southern Europe

	count	mean	sd	min	max
market_RSI	795	40.54591	21.73602	1	80
g_cases100k	780	57.9161	117.8906	-.4040714	748.3035
g_deaths100k	780	1.123939	2.549789	-.4523048	17.31658
stringency	795	46.34185	26.29474	0	96.3
econsupport	795	53.01887	33.15399	0	100

TABLE 3 (continued)**f. Latin America**

	count	mean	sd	min	max
market_RSI	530	42.88679	26.56565	1	80
g_cases100k	520	36.31582	51.12816	0	246.3407
g_deaths100k	520	1.13994	1.776847	0	15.79226
stringency	530	58.97732	30.16572	0	100
econsupport	530	41.58019	32.50223	0	100

g. North America

	count	mean	sd	min	max
market_RSI	106	37.73585	18.72778	7	74
g_cases100k	104	72.89453	102.6356	0	463.8697
g_deaths100k	104	1.402589	1.410535	0	5.45615
stringency	106	54.84009	26.07422	0	75.46
econsupport	106	53.89151	29.04037	0	75

h. South Asia and Middle East

	count	mean	Sd	min	max
market_RSI	636	40.47956	23.21433	1	80
g_cases100k	624	51.01512	86.15512	0	1203.091
g_deaths100k	624	.3522827	.4588852	0	2.98075
stringency	636	57.83392	28.00892	0	100
econsupport	636	44.65409	32.02359	0	100

i. Western Europe

	count	mean	sd	min	max
market_RSI	901	39.08768	23.12896	1	80
g_cases100k	884	68.73868	123.657	-179.5596	1075.221
g_deaths100k	884	1.357633	2.388899	-3.2232	18.49932
stringency	901	49.26022	25.26129	0	93.52
econsupport	901	59.43396	36.13918	0	100

TABLE 4: Stock Market Regressions for All 80 Countries

VARIABLES	March	April	May	June	July	August
L.market_RSI	-0.502*** (0.044)	-0.407*** (0.055)	-0.234*** (0.039)	-0.253*** (0.064)	-0.259*** (0.043)	-0.228*** (0.050)
g_cases100k	-0.334 (0.289)	0.161** (0.064)	0.074 (0.094)	0.220 (0.194)	0.115 (0.127)	0.174*** (0.054)
L.g_cases100k	0.068 (0.487)	-0.220*** (0.051)	-0.037 (0.107)	-0.296 (0.242)	0.127 (0.116)	0.140 (0.168)
g_deaths100k	-3.122 (4.282)	-2.731*** (0.651)	6.880*** (2.172)	3.378 (3.498)	-1.557 (2.377)	2.776* (1.526)
L.g_deaths100k	-7.161 (8.475)	2.931*** (1.034)	-3.302* (1.666)	7.889** (3.851)	-3.632** (1.495)	2.213* (1.279)
stringency	0.161*** (0.060)	-0.275 (0.333)	-0.025 (0.161)	0.117 (0.254)	0.640* (0.381)	-0.371 (0.274)
econsupport	-0.144* (0.073)	-0.015 (0.142)	0.484* (0.244)	-0.058 (0.420)	0.104 (0.200)	0.106 (0.588)
Constant	58.772*** (2.870)	81.153*** (27.107)	18.766 (16.711)	43.953 (31.508)	4.566 (26.160)	52.597 (42.888)
<i>Observations</i>	320	320	400	320	400	320
<i>R-squared</i>	0.262	0.190	0.079	0.082	0.100	0.097

VARIABLES	September	October	November	December	Overall
L.market_RSI	-0.365*** (0.040)	-0.321*** (0.037)	-0.187*** (0.038)	-0.205*** (0.056)	-0.095*** (0.016)
g_cases100k	0.110 (0.131)	0.107*** (0.039)	0.002 (0.048)	-0.003 (0.011)	0.030** (0.012)
L.g_cases100k	0.060 (0.108)	-0.094 (0.075)	-0.019 (0.036)	-0.030** (0.011)	-0.035*** (0.011)
g_deaths100k	-18.080*** (6.454)	-2.859 (2.196)	-0.086 (2.373)	1.273 (1.715)	-0.627 (0.460)
L.g_deaths100k	-6.440 (8.296)	1.693 (3.115)	-0.449 (2.157)	-1.008 (1.499)	0.462 (0.478)
stringency	-1.070*** (0.236)	0.158 (0.247)	0.190 (0.310)	-0.241 (0.342)	0.006 (0.019)
econsupport	-0.114 (0.169)	0.228 (0.190)	0.053 (0.200)	-0.612*** (0.220)	-0.018 (0.014)
Constant	126.146*** (17.053)	29.175* (16.411)	36.922 (23.421)	104.391*** (25.052)	45.238*** (1.212)
<i>Observations</i>	320	400	320	400	4,080
<i>R-squared</i>	0.193	0.136	0.061	0.059	0.013

Note: Robust standard errors are in parentheses; and *** p<0.01; ** p<0.05; * p<0.1

TABLE 5: Stock Market Regressions for Africa (11 Countries)

VARIABLES	March	April	May	June	July	August
L.market_RSI	-0.744*** (0.152)	-0.447** (0.172)	-0.312** (0.138)	-0.260 (0.201)	-0.325** (0.131)	0.082 (0.257)
g_cases100k	13.718 (8.696)	-20.311** (8.069)	1.529 (4.515)	0.130 (4.215)	-0.841* (0.401)	1.020 (1.194)
L.g_cases100k	-142.701** (55.279)	-8.377* (3.831)	1.622 (5.176)	1.039 (6.444)	0.469 (0.783)	-0.607 (0.420)
g_deaths100k	480.140*** (120.150)	235.157** (90.527)	86.765 (180.701)	32.621 (56.367)	35.143 (30.337)	15.499 (69.784)
L.g_deaths100k	-5,412.173** (1,762.566)	300.498 (226.469)	-472.027** (157.446)	-68.911 (49.951)	-5.399 (11.942)	-7.206 (30.337)
stringency	0.236 (0.172)	-0.745 (1.432)	0.221 (0.466)	0.409 (0.450)	-0.628 (1.750)	2.002 (3.224)
econsupport	0.619** (0.201)	0.199 (0.250)	1.348** (0.504)	0.932*** (0.262)	<i>N.A.</i>	1.608*** (0.356)
Constant	52.978*** (8.476)	128.909 (116.183)	-20.634 (49.962)	-31.262 (38.554)	96.370 (96.676)	-169.473 (201.462)
<i>Observations</i>	44	44	55	44	55	44
<i>R-squared</i>	0.497	0.384	0.247	0.123	0.232	0.192

VARIABLES	September	October	November	December	Overall
L.market_RSI	-0.497*** (0.082)	-0.353*** (0.106)	-0.248*** (0.074)	0.223 (0.208)	-0.080* (0.044)
g_cases100k	-0.864*** (0.222)	-0.129 (0.253)	-0.229 (0.461)	-0.538 (0.416)	-0.077 (0.190)
L.g_cases100k	2.892*** (0.510)	-0.441*** (0.087)	-0.200 (0.403)	0.165 (0.253)	0.079 (0.182)
g_deaths100k	75.342*** (22.311)	0.205 (10.781)	-0.440 (5.295)	63.061** (27.461)	6.573 (5.506)
L.g_deaths100k	-113.612*** (29.899)	-23.332** (7.574)	-5.711 (6.054)	-51.258** (19.772)	-4.990 (5.239)
stringency	-0.224 (0.335)	0.723 (0.834)	-0.664 (1.975)	1.773 (1.053)	0.113** (0.043)
econsupport	-0.044 (0.175)	-0.053 (0.322)	-0.321** (0.109)	<i>N.A.</i>	0.004 (0.037)
Constant	65.039** (24.355)	34.532 (42.385)	127.520 (115.204)	-58.046 (52.808)	39.884*** (3.485)
<i>Observations</i>	44	55	44	55	561
<i>R-squared</i>	0.456	0.220	0.204	0.198	0.026

TABLE 6: Stock Market Regressions for East Asia (11 Countries)

VARIABLES	March	April	May	June	July	August
L.market_RSI	-0.530* (0.254)	-0.536*** (0.097)	-0.294** (0.117)	0.110 (0.140)	-0.165 (0.122)	-0.299** (0.097)
g_cases100k	-4.509 (2.679)	-1.108 (0.941)	-0.701 (0.488)	-3.563*** (1.087)	1.280* (0.665)	0.995* (0.520)
L.g_cases100k	3.252 (2.168)	2.896 (2.244)	-0.116 (0.583)	3.816*** (1.172)	-0.122 (1.088)	-1.329** (0.554)
g_deaths100k	-116.483 (300.361)	-123.979 (106.059)	-109.811 (240.260)	476.655 (415.277)	110.931 (117.489)	24.827 (83.461)
L.g_deaths100k	-792.754** (303.131)	226.992 (196.603)	253.016 (305.944)	267.141 (247.474)	-4.059 (75.972)	165.591 (181.660)
stringency	0.572*** (0.135)	-0.566 (0.475)	0.105 (0.462)	-0.467 (0.490)	0.904 (0.529)	3.805 (3.612)
econsupport	0.164 (0.395)	0.070 (0.305)	0.247 (0.441)	<i>N.A.</i>	0.675 (0.496)	<i>N.A.</i>
Constant	29.941** (11.627)	84.926** (35.623)	36.648 (32.772)	41.930 (29.311)	-47.830 (34.670)	-171.266 (211.734)
<i>Observations</i>	44	44	55	44	55	44
<i>R-squared</i>	0.357	0.563	0.166	0.309	0.169	0.217
VARIABLES	September	October	November	December	Overall	
L.market_RSI	-0.395*** (0.069)	-0.409*** (0.105)	-0.404*** (0.093)	-0.130 (0.089)	-0.102** (0.045)	
g_cases100k	-1.271 (4.036)	3.423** (1.138)	2.395 (2.120)	-0.037 (2.640)	0.393** (0.128)	
L.g_cases100k	-1.583 (2.304)	-7.571*** (0.837)	-5.564** (2.488)	7.108** (3.070)	-0.193 (0.109)	
g_deaths100k	92.402 (72.386)	209.814*** (26.199)	-267.268* (136.796)	-34.593 (121.723)	18.023 (12.643)	
L.g_deaths100k	20.187 (57.935)	379.406*** (47.946)	-519.049** (230.209)	-283.198** (111.966)	-30.654* (14.542)	
stringency	-1.394** (0.470)	-0.192 (0.580)	-0.544 (0.319)	0.634 (0.995)	-0.120* (0.064)	
econsupport	-0.838* (0.445)	0.075 (0.272)	-1.044*** (0.279)	<i>N.A.</i>	-0.013 (0.031)	
Constant	185.791*** (42.899)	30.843 (17.288)	207.107*** (39.709)	-18.009 (60.508)	50.157*** (3.483)	
<i>Observations</i>	44	55	44	55	561	
<i>R-squared</i>	0.378	0.310	0.544	0.237	0.028	

TABLE 7: Stock Market Regressions for Eastern/Southern Europe (15 Countries)

VARIABLES	March	April	May	June	July	August
L.market_RSI	-0.428*** (0.099)	-0.468*** (0.118)	-0.248** (0.112)	-0.218 (0.183)	-0.428*** (0.140)	-0.335*** (0.112)
g_cases100k	-0.181 (1.416)	1.574 (0.942)	-0.834 (0.886)	3.445** (1.261)	-0.570 (1.718)	-1.938* (0.960)
L.g_cases100k	0.620 (1.678)	-0.639 (0.908)	0.022 (0.573)	-1.218 (1.402)	-1.718 (2.570)	3.280** (1.483)
g_deaths100k	-15.519 (24.565)	-28.022 (21.217)	22.677 (26.760)	-19.849 (61.024)	29.426 (77.903)	-6.398 (35.036)
L.g_deaths100k	-656.247** (254.080)	11.441 (15.646)	4.998 (24.329)	-38.381 (70.173)	22.175 (50.650)	-6.396 (29.155)
stringency	0.202 (0.199)	0.716 (0.928)	0.205 (0.345)	1.188** (0.412)	0.486 (0.682)	-2.348 (1.681)
econsupport	0.109 (0.193)	-0.094 (0.346)	-0.213** (0.091)	-0.622 (0.411)	-0.326 (0.551)	-1.406*** (0.399)
Constant	46.634*** (5.823)	4.741 (72.788)	46.776** (20.599)	30.250 (42.737)	68.592 (66.061)	241.655*** (43.420)
<i>Observations</i>	60	60	75	60	75	60
<i>R-squared</i>	0.299	0.299	0.105	0.244	0.227	0.290

VARIABLES	September	October	November	December	Overall
L.market_RSI	-0.363** (0.123)	-0.341** (0.121)	-0.068 (0.100)	-0.226 (0.137)	-0.087** (0.032)
g_cases100k	0.675 (0.935)	0.290*** (0.080)	0.004 (0.057)	0.042 (0.042)	0.054 (0.039)
L.g_cases100k	-0.071 (1.039)	-0.635** (0.250)	0.055 (0.067)	-0.093 (0.078)	-0.048 (0.040)
g_deaths100k	42.726 (36.303)	6.618 (11.298)	-8.207 (4.938)	0.702 (3.306)	-0.810 (2.483)
L.g_deaths100k	-53.162 (31.399)	-2.505 (9.568)	5.420 (5.000)	-0.064 (1.879)	0.210 (2.215)
stringency	0.104 (0.857)	0.420 (0.572)	-0.178 (0.769)	0.195 (0.575)	-0.047 (0.039)
econsupport	0.338 (0.349)	0.729 (0.418)	0.441** (0.180)	0.179 (0.599)	0.030 (0.026)
Constant	22.225 (63.869)	4.157 (37.693)	26.000 (36.055)	31.965 (59.332)	45.128*** (2.753)
<i>Observations</i>	60	75	60	75	765
<i>R-squared</i>	0.283	0.258	0.141	0.098	0.018

TABLE 8: Stock Market Regressions for Latin America (10 Countries)

VARIABLES	March	April	May	June	July	August
L.market_RSI	-0.670*** (0.078)	-0.203 (0.226)	-0.266*** (0.078)	-0.410* (0.206)	-0.204 (0.113)	-0.162 (0.184)
g_cases100k	10.573 (11.344)	-1.421 (1.577)	0.151 (0.527)	0.473 (0.564)	0.279 (0.857)	0.729* (0.368)
L.g_cases100k	-18.246 (36.549)	1.166 (3.572)	0.047 (0.605)	0.364 (0.726)	0.093 (0.470)	0.285 (0.620)
g_deaths100k	97.397 (191.826)	23.488 (14.754)	12.702 (47.466)	0.780 (10.623)	-2.405 (2.878)	1.690 (2.042)
L.g_deaths100k	1,305.017*** (299.437)	15.234 (14.131)	-18.446 (46.832)	22.164* (11.818)	-4.318* (1.917)	1.667 (1.707)
stringency	-0.167 (0.266)	0.117 (0.189)	-0.411 (0.644)	1.919** (0.675)	1.623 (1.082)	-1.604 (1.380)
econsupport	0.072 (0.202)	1.024 (0.840)	-1.503*** (0.191)	-1.496* (0.763)	0.163*** (0.014)	-0.738* (0.361)
Constant	79.437*** (9.885)	-7.653 (38.750)	159.103** (60.377)	-76.639 (65.775)	-82.996 (81.419)	137.262 (75.742)
Observations	40	40	50	40	50	40
R-squared	0.404	0.186	0.108	0.419	0.153	0.153

VARIABLES	September	October	November	December	Overall
L.market_RSI	-0.276** (0.121)	-0.341** (0.107)	0.027 (0.080)	-0.211 (0.164)	-0.065 (0.051)
g_cases100k	-0.685 (0.553)	-0.900** (0.350)	0.658 (0.378)	0.689* (0.375)	-0.187 (0.133)
L.g_cases100k	-0.424 (0.378)	0.560 (0.398)	-1.352* (0.666)	0.225 (0.289)	0.173 (0.133)
g_deaths100k	-16.887** (6.769)	-0.590 (3.509)	-1.091 (17.140)	-13.964 (11.587)	-0.380 (0.481)
L.g_deaths100k	10.618 (13.972)	-1.719 (1.916)	41.564** (17.820)	26.028 (16.944)	-1.011 (0.554)
stringency	0.451 (3.357)	1.211 (1.438)	-0.641 (4.114)	-1.847 (1.238)	-0.018 (0.052)
econsupport	N.A.	0.546 (0.384)	1.940 (1.178)	0.010 (0.199)	-0.020 (0.048)
Constant	109.093 (235.789)	-36.296 (90.164)	-51.570 (211.930)	102.468 (90.198)	50.040*** (3.678)
Observations	40	50	40	50	510
R-squared	0.368	0.345	0.380	0.273	0.021

TABLE 9: Stock Market Regressions for South Asia and Middle East (12 Countries)

VARIABLES	March	April	May	June	July	August
L.market_RSI	-0.568*** (0.119)	-0.346** (0.125)	-0.304** (0.136)	-0.393** (0.146)	-0.451*** (0.064)	-0.373** (0.146)
g_cases100k	-1.833*** (0.311)	0.307 (0.228)	-0.116 (0.089)	0.206 (0.276)	0.036 (0.170)	-0.095 (0.304)
L.g_cases100k	-6.225*** (1.282)	-0.500 (0.530)	0.079 (0.097)	-0.414 (0.337)	0.078 (0.110)	-0.003 (0.274)
g_deaths100k	301.004*** (93.478)	-43.091 (85.319)	51.445*** (10.123)	29.386 (29.490)	-18.239* (8.716)	41.388* (21.533)
L.g_deaths100k	-304.246 (370.710)	16.517 (47.538)	-23.748 (16.573)	-15.818 (22.477)	-1.660 (7.496)	21.193 (32.716)
stringency	0.239 (0.187)	1.535 (1.493)	-2.735*** (0.549)	5.126*** (1.428)	-0.288 (0.623)	-0.470 (0.448)
econsupport	-0.153 (0.489)	0.017 (0.398)	1.214*** (0.312)	<i>N.A.</i>	0.205 (0.181)	2.043*** (0.310)
Constant	60.284*** (9.090)	-74.888 (139.403)	211.773*** (52.258)	-322.243** (110.870)	68.880 (50.708)	-77.688** (28.648)
<i>Observations</i>	48	48	60	48	60	48
<i>R-squared</i>	0.391	0.139	0.338	0.243	0.239	0.232

VARIABLES	September	October	November	December	Overall
L.market_RSI	-0.481*** (0.136)	-0.376*** (0.092)	-0.147 (0.152)	-0.177 (0.228)	-0.091** (0.038)
g_cases100k	0.578*** (0.171)	0.085 (0.134)	0.316 (0.210)	-0.008 (0.011)	0.003 (0.012)
L.g_cases100k	-0.256** (0.105)	-0.216** (0.089)	-0.426 (0.340)	-0.028*** (0.009)	-0.029** (0.010)
g_deaths100k	-55.666 (46.227)	4.572 (19.869)	8.720 (9.381)	-24.143 (16.088)	7.230 (5.575)
L.g_deaths100k	11.466 (48.205)	-12.941 (26.220)	-2.006 (8.550)	-3.493 (25.960)	-7.233* (3.677)
stringency	-1.780*** (0.349)	0.828 (0.553)	0.119 (0.221)	-0.874 (0.546)	0.020 (0.036)
econsupport	<i>N.A.</i>	-0.267 (0.472)	-0.322** (0.126)	-0.584* (0.288)	0.038 (0.041)
Constant	159.008*** (17.888)	36.473** (15.050)	70.664*** (20.417)	153.390*** (24.035)	42.441*** (2.432)
<i>Observations</i>	48	60	48	60	612
<i>R-squared</i>	0.484	0.230	0.208	0.168	0.018

TABLE 10: Stock Market Regressions for Western Europe (17 Countries)

VARIABLES	March	April	May	June	July	August
L.market_RSI	-0.498*** (0.096)	-0.483*** (0.140)	-0.117 (0.074)	-0.319*** (0.109)	-0.107 (0.076)	-0.379*** (0.039)
g_cases100k	-0.114 (0.265)	0.147 (0.091)	1.694 (1.237)	5.975** (2.200)	1.064*** (0.346)	0.136** (0.059)
L.g_cases100k	0.025 (0.420)	-0.135* (0.073)	-0.880 (0.835)	-4.796*** (1.393)	0.033 (0.167)	-0.253 (0.325)
g_deaths100k	-0.891 (3.503)	-3.102*** (0.698)	7.139*** (2.252)	-6.858 (6.785)	-114.578*** (30.085)	10.443 (7.862)
L.g_deaths100k	-12.493* (7.105)	3.020** (1.257)	-3.941 (5.521)	2.587 (4.790)	28.716 (34.079)	35.886 (33.406)
stringency	-0.207 (0.154)	-1.897 (1.118)	-0.459 (0.452)	-0.571 (0.341)	0.229 (0.541)	0.408 (0.344)
econsupport	-0.158 (0.102)	-0.554*** (0.099)	1.402** (0.561)	<i>N.A.</i>	-0.272 (0.302)	<i>N.A.</i>
Constant	85.220*** (6.609)	250.937** (87.328)	-45.938 (35.082)	74.225*** (22.815)	46.982 (29.883)	26.006 (16.776)
<i>Observations</i>	68	68	85	68	85	68
<i>R-squared</i>	0.457	0.449	0.109	0.222	0.233	0.306
VARIABLES	September	October	November	December	Overall	
L.market_RSI	-0.410*** (0.085)	-0.214*** (0.061)	-0.163* (0.085)	-0.396*** (0.108)	-0.160*** (0.029)	
g_cases100k	0.004 (0.317)	0.080 (0.048)	-0.052 (0.055)	-0.043 (0.045)	0.051*** (0.009)	
L.g_cases100k	0.176** (0.061)	-0.034 (0.108)	-0.026 (0.053)	0.021 (0.066)	-0.059*** (0.015)	
g_deaths100k	-8.524 (17.846)	-3.357 (4.885)	4.042* (2.225)	3.119 (4.030)	-1.251** (0.544)	
L.g_deaths100k	6.475 (17.787)	19.665*** (6.074)	-3.714* (1.775)	-4.854* (2.395)	1.861*** (0.378)	
stringency	0.173 (0.948)	0.121 (0.483)	0.829 (1.213)	-0.863* (0.476)	-0.025 (0.056)	
econsupport	-0.214 (0.407)	-0.267 (0.390)	-0.075 (0.479)	-0.886*** (0.103)	-0.060 (0.041)	
Constant	62.757 (55.013)	44.764 (35.564)	5.512 (105.188)	189.460*** (28.876)	49.459*** (2.153)	
<i>Observations</i>	68	85	68	85	867	
<i>R-squared</i>	0.183	0.311	0.125	0.196	0.045	

APPENDIX

TABLE A1: Unit Root Tests

Harris-Tzavalis (1999) test statistics:

Ho: Panels contain unit roots	Number of panels = 80
Ha: Panels are stationary	Number of periods = 52
AR parameter: Common	Asymptotics: N -> Infinity
Panel means: Included	T Fixed
Time trend: Not included	

	<i>Test</i>		
	<i>Statistic</i>	<i>z</i>	<i>p-value</i>
g_cases100k	0.9292	-2.1264	0.0167
g_deaths100k	0.9265	-2.5296	0.0057
econsupport	0.9299	-2.2308	0.0128
stringency	0.9161	-4.3313	0.0000