The Early Impact of Government Financial Intervention Policies and Cultural Secrecy on Stock Market Returns During the COVID-19 Pandemic: Evidence From Developing Countries (Note 1)

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Abstract

This paper examines the role of government financial intervention policies and cultural secrecy on equity market returns during the start of the COVID-19 pandemic in developing countries' stock markets. We employ global data including 939 observations across 32 developing countries (23 emerging and 9 frontier stock markets) from December 1 to April 28, 2020. Our results show that the above-mentioned policies that set out to curb the COVID-19 pandemic succeed in increasing equity returns. It reflects investors' improved perceptions of governments' commitment to stabilizing the economy during the pandemic in developing, emerging, and frontier equity markets. Results show that investors in all equity markets discount differences in cultural secrecy in processing market information when investing in equity markets. We uncover evidence showing that equity market investors in developing and emerging countries truly react negatively to the rise in the number of confirmed COVID-19 cases reported. Yet, we find that COVID-19 wields no influence on equity market returns in frontier equity markets. This presents frontier equity markets as a safe-haven investment destination during a global health outbreak. Our work helps investors during such events to identify the best and worst investment destinations in developing, emerging, and frontier stock markets. At the same time, it is important to understand the critical roles of: firstly, the introduced government financial intervention policies; and secondly, the daily growth in reported COVID-19 cases on equity market returns.

Keywords: COVID-19, coronavirus, government financial intervention, cultural secrecy, stock market returns

1. Introduction

Since the first detection of the coronavirus (COVID-19) in China in late 2019, the virus has become a pandemic rapidly spreading throughout the world (Goodell 2020; Ji et al. 2020). The drastic influence of the COVID-19 virus goes beyond health problems to disturbing the stability of the investment industry, a consequence of financial markets experiencing a sharp increase in risk (Ji et al. 2020; Sharif et al. 2020) and significant free fall in returns (Ashraf 2020; Liu et al. 2020; Salisu & Vo 2020). Stock market returns in developing countries such as China where the government has been criticized for having a secretive culture in managing information yet has interfered financially in their equity markets to alter investors' expectations, seem to perform well during the COVID-19 pandemic (Jaworsky & Qiaoan 2020; Zaremba et al. 2020). Research shows that investors prefer investing in developing countries seeking higher investment returns compared to developed equity markets (Asiedu 2002; Batten & Vo 2015). This may imply that investors could encounter a good investing opportunity by putting their money into developing countries such as China, Saudi Arabia or Mexico. These countries all share a similar secretive culture in handling information yet have interfered financially in their stock markets to change investors' expectations.

Developing countries are indifferent to their ability to provide government financial intervention policies, level of cultural secrecy, and level of stock market development (Doupnik & Riccio 2006; Jamaani & Roca 2015; Adebayo 2016; Barakat et al. 2016; Zhong & Tang 2018). For example, the COVID-19 Finance Sector Related Policy Responses Report published by the World Bank Group (2020) shows that the South Korean government manages to

provide 19 financial intervention policies while Lithuania's government was only able to offer three financial intervention actions from December 2020 to April 2020. Lithuania enjoys lower level of cultural secrecy scoring 47 on the cultural secrecy index (Note 2) while South Korea has a high secrecy culture scoring 127. Research also indicates that the degree of stock market development in developing countries is also indifferent (Jamaani & Roca 2015; Barakat et al. 2016). For example, MSCI (2020) divides developing market economies into two classes, namely emerging and frontier markets based on their stock market development. MSCI (2020) classifies South Korea as an emerging economy while it classifies Lithuania as a frontier one. Research shows that frontier equity markets have inferior market regulation, inefficient allocation of market resources, volatile and less diverse stock markets, poor levels of corporate governance, and asymmetric information environment compared to emerging economies (Dimic et al. 2015; Narayan & Rehman 2017; Luu & Luomg 2020).

We see only a narrow understanding about the role of government financial intervention policies and cultural secrecy in influencing equity market returns in developing countries during the early spread of the COVID-19 virus. Therefore, it becomes unclear to investors if developing equity markets including emerging and frontier ones can really offer safe-haven investment destinations where they can make good investment returns during the start of the COVID-19 pandemic.

In this paper, we pose several questions. Shall investors evade investing in developing market economies where the coronavirus has rapidly spread?; or shall investors avoid investing in developing countries where governments fail to provide financial intervention policies to restore investors' confidence?; or shall investors evade investing in developing market economies where governments have a tendency of cultural secrecy in relation to the processing market information? Is there a difference between emerging and frontier stock markets in relation to the influence of the COVID-19 disease on equity market returns when we incorporate differences in government financial intervention policies and their level of cultural secrecy? We aim to address these important questions in this empirical work.

The aim of this paper is to provide three novel outcomes. First, we aim to provide an understanding of the role of government financial intervention policies on equity market returns in developing stock markets during the commencement of the COVID-19 pandemic. Second, we aim to provide an understanding about the role of cultural secrecy in processing market information on equity market returns in the developing stock markets during the beginning of the COVID-19 pandemic. Third, we aim to investigate the role of government financial intervention policies and cultural secrecy in processing market information on equity market returns in subsamples of developing countries including emerging and frontier stock markets. We employ a total sample of 939 observations across 32 developing countries (23 emerging and 9 frontier stock markets) from December 1 to April 28, 2020. We deploy a series of panel regression tests to attain our outcomes utilizing daily growth in the confirmed cases of the COVID-19 virus, daily MSCI index prices, Gray's secrecy measure for all selected countries, and daily World Bank government financial intervention measures.

We reach several interesting findings. We attain evidence showing that the offered government financial intervention policies that were devised to curb the drastic effect of COVID-19 succeed in enhancing investors' outlook of policymakers' devotion to stabilize the economy in developing, emerging, and frontier stock markets when the pandemic began. Our results show that investors in developing stock markets including ones investing in emerging and frontier equity markets neglect variations in cultural secrecy in processing market information when investing in securities. Our results confirm that investors in developing and emerging countries certainly react negatively to the increase in the number of confirmed COVID-19 cases reported. However, our results confirm that the COVID-19 pandemic has no influence on equity market returns in frontier equity markets. Our results confirm that frontier stock markets are indeed a safe-haven investment destination during a global health eruption.

Our study is important to investors around the globe in that it is expected to inform portfolio managers and investors about the safe-haven investment destinations in developing, emerging, and frontier equity markets while understanding the important roles of the offered government financial intervention policies and the daily growth of the reported COVID-19 cases on equity market returns. We uncover evidence showing that investors can attain good investment returns by investing in emerging stock markets that have a daily COVID-19 growth below the daily average growth of 0.23, and whereby governments introduce nine and more financial intervention policies. This includes China, India, South Korea, Philippines, Mexico and Russian Federation. We also show that investors can achieve valuable investment returns in frontier equity markets that introduce more than 4 government financial intervention policies. This includes Bangladesh, Bulgaria, Croatia, and Serbia. This paper is divided into seven sections. Section 2 presents literature review. Section 3 explains the hypotheses development. Section 4 summaries

the utilized data and methodology. Section 5 provides the results and discussion. Section 6 is the conclusion and Section 7 presents the limitations and suggestions for future research.

2. Literature Review

There is abundant finance research that investigates the impact of the COVID-19 pandemic on capital market outcomes (Al-Awadhi et al. 2020; Ashraf 2020; Liu et al. 2020; Salisu & Vo 2020). Yet, most of the existing research has not looked at the role of government financial intervention policies and cultural secrecy in processing market information on equity market returns in developing countries during the start of the COVID-19 pandemic. For example, Zhang et al. (2020) document that large surges in international financial market risk commenced when COVID-19 started to spread. Ashraf (2020) has evidence showing that equity investors reacted negatively to the growth in COVID-19 confirmed cases at a global level. Some governments during 2020 implemented a series of classic policy responses ranging from shutting down workplaces, locking down whole communities and education institutions to imposing strict limits on people's movements to control the spread of the COVID-19 infection (Ali et al. 2020; Ashraf 2020; Elenev et al. 2020; Hale et al. 2020; Zaremba et al. 2020). Yet, some countries have been more active in delivering a range of financial intervention policies to halt the dramatic impact of COVID-19 on their economy and stock markets (World Bank Group 2020). The outcome of government financial intervention policies on stock market returns during the COVID-19 period is still unknown.

The finance literature suggests that dissimilarities in nation-states' characteristics such as differences in cultural secrecy may cause variations in information asymmetry in regard to government intervention policies, leading to marked differences in investors' reactions and stock market outcomes from country to country (Gray & Vint 1995; Doupnik & Riccio 2006; Lucey & Zhang 2010; Aggarwal & Goodell 2014; Chang & Lin 2015; Houqe et al. 2016; Farooq & Amin 2017; Nam 2018; Wijayana & Gray 2018; Gätsche et al. 2020). For example, research argues that an environment that agonizes from asymmetric information problem may establish in certain secretive cultures more effortlessly than others, owing to the lack of trust in government policies that increase uncertainty for equity investors (Kang & Kim 2010; Li et al. 2013). As such, we argue that it is relevant to consider differences in cultural secrecy while examining the effect of the COVID-19 infection on equity market returns.

Nonetheless recent research such as Zaremba et al. (2020) detects a significant impact of differences in the classical policy responses on stock market volatility. To date, there is a lack of current empirical work verifying the outcome of differences of government financial interventions and cultural secrecy on stock market returns in response to the early impact of COVID-19 in developing countries. The objective of our paper is to fill an unfolding research gap in the knowledge on this subject. Offered here is the first empirical work that investigates the role of government financial intervention policies and cultural secrecy in processing market information on equity market returns in developing countries and a subsample of emerging and frontier stock markets during the beginning of the COVID-19 pandemic.

3. Hypotheses Development

3.1 The Impact of Government Financial Interventions on Equity Market Returns in Developing Countries

Unlike the foreign exchange market, government financial interventions in equity markets are an unusual event (Naranjo & Nimalendran 2000; Su et al. 2002; Pasquariello 2018). One of the commonly cited motives for such interventions is to alleviate investors' concern in order to reinstate investors' assurance in the economy and market by offering various financial support and restrictive policies to stabilize equity prices (Su et al. 2002; Pasquariello 2018). Yet, such government interference can harm a market's reputation and therefore may depress future foreign investments (Elenev et al. 2020). Also, such government intervention is likely to be read as a bailout of rich investors by governments (Chari & Kehoe 2016). For example, the global financial crisis (GFC) of 2008, which some researchers claimed resembled the drastic influence of the COVID-19 disease in terms of wrecking the global economy, is described as a once-in-a-century economic storm (Elenev et al. 2020; Sharma & Nicolau 2020). The unexpected economic decline caused by the GFC took thousands of businesses by surprise in every corner of the globe. Some were privileged to be bailed out by their governments while others were less fortunate to be liquidated or even filed for bankruptcy (Khan & Batteau 2011). Policymakers around the globe took extreme steps to slow down imminent recessionary pressures and resuscitate their national economies (Ding et al. 2013). In doing so, some developing countries manipulated their own equity markets in different ways. For illustration, in China, the government introduced both indirect and direct intervening financial stimulus plans to its equity market once it had lost approximately 70% of its market capitalization (Khan & Batteau 2011). The plans involved removing the stamp duty on shares acquisitions and purchasing the firms' shares in order to stabilize the market. In Russia, the

government put off trading in September 2008 and then interfered numerous times later to stop the decline in its equity market (Breitenfellner & Wagner 2010).

In response to the drastic influence of the COVID-19 disease on the economy and equity markets, on the 1st of February 2020, the Chinse government intervened to support financial institutions by requiring banks and insurance firms to guarantee the safety, smoothness and efficiency of financial services by providing a fast path for affected operations and businesses. Then on 17th of February 2020, China made a medium-term loan facility rate cut by 10 basis points to 4.050% and injected RMB 200 billion (0.2 percent of GDP) of funds via medium-term loan facility. Other emerging and frontier economies throughout the world followed by introducing a range of financial intervention policies aiming at easing the severe economic impact of the COVID-19 disease. Such intervention initiatives ranged from introducing new payment systems (Note 3), supporting borrowers (Note 4), cutting interest rates (Note 5), deferring loan payments, offering exemptions from the costs of a loan guarantee, and offering concessional financing to engaging in asset purchases (Note 6) (World Bank Group 2020).

Previous research shows that influencing equity returns through government financial intervention policies may influence the fundamentals of securities trading in equity markets, therefore altering market expectations (Bond & Goldstein 2015). Several studies including Su et al. (2002), Breitenfellner and Wagner (2010), Khan and Batteau (2011), and Chang and Chen (2016) report positive outcomes of government financial interventions on stock market returns during seismic events such as the GFC and Asian Financial Crisis on stock market returns. Researchers argue (Note 7) that government intervention during crises such as the COVID-19 disease can circumvent rapid price drops in equity market returns and reduce investors' concern, thereby restoring their confidence in developing countries (Elenev et al. 2020; Sharma & Nicolau 2020). Also research shows that government interventions in equity markets help restore confidence in the economy, minimize investors' negative sentiment, and stabilize stock market returns in developing countries (Su et al. 2002; Pasquariello 2018). Based on the above discussion, we develop the following hypothesis:

H1: Government financial intervention policies minimize investors' negative sentiment resulting from the influence of COVID-19 contagion, and subsequently increase equity market returns in developing countries.

3.2 The Influence of Cultural Secrecy on Equity Market Returns in Developing Countries

To understand the possible connection between the effect of COVID-19 on equity market returns across different countries' national cultures, one should initially pose the following query: what is a national culture? Hofstede (1980) defines a national culture as "the collective programming of the mind that distinguishes the members of one group or category of people from another". Research on culture develops from various origins in the social sciences research where national culture in its core essence is seen as the values of a system (Dumay 2009). Consequently, to fully understand a culture, it is necessary to comprehend its cultural values. Sapienza et al. (2006) define a national culture as "those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation". In this framework, values of a national culture create multifarious forms of thinking transmitted from fathers to offspring, from educators to pupils, from masters to master, from masters to followers, from corporations to corporations, and from country to country (Rokeach 1973).

Research links national cultures to information asymmetry in that culture systemically biases investors' behaviours and so the behaviours of stock market returns in developing countries will differ (Lucey & Zhang 2010; Chang & Lin 2015; Farooq & Amin 2017; Nam 2018). For example, Gupta et al. (2018) argue that an environment that suffers from asymmetric information problem may establishe in certain national cultures more naturally than in others. This is because the presence of frequently recognized cultural standards that facilitate the creation of uncertainty between investors resulted from a lack of trust in government policies (Kang & Kim 2010; Li et al. 2013). Gray (1988) designs a secrecy theory which links transparency in accounting information with Hofstede's cultural dimensions, discovering that culture indeed impacts on secrecy in financial reporting practices. Gray describes secrecy as "a preference for confidentiality and restriction of disclosure of information about the business only to those who are closely involved with its management and financing as opposed to a more transparent, open and publicly accountable approach" (Gray 1988, p. 8). The scholar develops a secrecy index calculated using three dimensions of Hofstede's (2001) cultural measures of power distance (Note 8), uncertainty avoidance (Note 9), and individualism (Note 10) Gray (1988) and Gray and Vint (1995) discover that when a country's culture is characterized by having a high level of uncertainty avoidance and power distance and low level of individualism, then managers tend to be very secretive about financial reporting practices.

Finance research uncovers a strong relationship between the asymmetric information problem in stock markets that are described as having a high level of cultural secrecy (Gray & Vint 1995; Hope et al. 2008; Houqe et al. 2016;

Mazboudi & Hasan 2018; Pasiouras et al. 2020). For instance, Hope et al. (2008) and Pasiouras et al. (2020) learn that investors domiciled in secretive cultures such as Russia, India, and China tend to suffer from a lack of social trust. Subsequently, this lsck of societal trust develops an environment that agnizes from information asymmetry problem irrespective of company-level uncertainty characteristics (Houqe et al. 2016; Mazboudi & Hasan 2018). Hooi (2007) and Agyei-Mensah and Buertey (2019) argue that in secretive cultures such as Russia, India, and China, the presence of feeble country governance traditions is frequently connected with the creation of a weak societal trust between investors. This is owned to people's political authority and societal strata impact on the circulation of private capital market information in those countries. This results in increasing uncertainty problem for investors and leads to the market pricing the risks erroneously and inefficiently (Lucey & Zhang 2010; Ngene et al. 2014). Research reveals that in countries exhibiting a high level of uncertainty avoidance, power distance and low level of individualism countries (high secrecy), investors tend to overreact to new stock market information. This results in equity prices experiencing higher returns (Lucey & Zhang 2010; Farooq & Amin 2017).

We argue that in high secrecy cultures, equity markets are likely to agonize about the information asymmetry problem and information inefficiency in which investors tend to overdramatize government financial intervention news, causing equity returns to experience positive price changes. Investors born and raised in such secretive cultural environments that are structured with a low social trust in governments, will always question the reliability of information related to the reported news about confirmed COVID-19 cases. Thus, investors in secretive cultures will be very sensitive to the COVID-19 negative news causing an ongoing anxiety to prevail in equity markets, in turn, overreacting negatively to the growth in reported COVID-19 confirmed cases. Based on the above discussion, we develop the following hypothesis:

H2: Higher cultural secrecy maximizes investors' negative sentiment resulting from the influence of COVID-19 contagion, subsequently reducing equity market returns in developing countries.

3.3 The Difference Between Emerging and Frontier Economies

Research indicates that developing stock markets comprise both emerging and frontier stock markets where the latter have inferior market regulation, inefficient allocation of market resources and information, and higher asymmetric information problem compared to the former (Dimic et al. 2015; Narayan & Rehman 2017; Luu & Luomg 2020). This implies that negative information about the growth of the confirmed COVID-19 cases is likely to be reflected more quickly in emerging countries compared to frontier ones. that emerging compared to frontier economies enjoy greater economic resources, so governments in emerging countries can afford introducing financial intervention policies that are difficult to be afforded by governments in frontier economies (Doupnik & Riccio 2006; Jamaani & Roca 2015; Adebayo 2016; Barakat et al. 2016; Zhong & Tang 2018). This suggests that the impact of government financial intervention policies in emerging countries is likely to be higher than frontier ones. It emerges in the research that frontier economies tend to have higher uncertainty avoidance, power distance, and lower levels of individualism (high secrecy) compared to emerging economies (Doupnik & Riccio 2006; Lucey & Zhang 2010; Farooq & Amin 2017). This suggests that the influence of cultural secrecy on equtiy market returns in emerging countries is probably lower than in frontier ones. Building on the above discussion and previous two hypotheses, we develop the following hypotheses:

H3: The influence of the COVID-19 pandemic is greater in emerging countries compared to frontier ones.

H4: The influence of government financial interventions is greater in emerging countries compared to frontier ones during the COVID-19 period.

H5: The influence of cultural secrecy on equtiy market returns in frontier economies is greater than emerging economies during the COVID-19 period.

4. Data and Methodology

We employ 939 observations across 32 developing countries (23 emerging and 9 frontier stock markets (Note 11)) from December 1 to April 28, 2020. Our data includes daily growth in the total confirmed cases of the COVID-19 disease, daily MSCI index prices, Gray's secrecy measure, and daily World Bank government financial intervention measures for all chosen countries. To test our proposed five hypotheses, we employ several panel data regression estimations. Firstly, we develop our first model to examine if government financial intervention policies diminish investors' negative sentiment resulting from the influence of COVID-19 contagion, and subsequently rise stock market returns in developing countries as shown in Equation 1:

$$R_{itd} = \alpha_0 + \alpha_1 GFI_{it} + \beta \boldsymbol{X} + \varepsilon i \quad (1)$$

where: R_{it} is the daily MSCI index return for country i in developing countries at day t; GFI_{it} is the government financial intervention dummy variable while $\boldsymbol{X}$ is a set of the control factors including FSE_{it} that captures the cultural secrecy variable; and $GTCC_{it}$ is the daily growth in confirmed COVID-19 cases for country i at day t; DC_{it} captures the daily number of confirmed COVID-19 deaths for country i at day t; CC_{it} captures the level of control of corruption in every country in 2019; and a country dummy effect variable to control for difference across countries. Secondly, we develop a second model to examine if higher cultural secrecy reduces investors' negative sentiment resulting from the influence of COVID-19 contagion, subsequently reducing equity market returns in developing countries as shown in Equation 2:

$$R_{itd} = \alpha_0 + \alpha_1 FSE_{it} + \beta \boldsymbol{X} + \varepsilon i \tag{2}$$

where: R_{itd} is the daily MSCI index return for country i in developing countries at day t; FSE_{it} captures the cultural secrecy variable while $\boldsymbol{X}$ is a set of the control factors including GFI_{it} that captures the government financial intervention dummy variable; and $GTCC_{it}$ is the daily growth in confirmed COVID-19 cases for country i at day t; DC_{it} captures the daily number of confirmed COVID-19 deaths for country i at day t; CC_{it} captures the level of control of corruption in every country in 2019; and a country dummy effect variable to control for difference across countries. Thirdly, we develop two additional models to study if the influence of the COVID-19 contagion is greater in emerging countries compared to frontier ones as shown in Equations 3 and 4:

$$R_{ite} = \alpha_0 + \alpha_1 GTCC_{ite} + \beta \boldsymbol{X} + \varepsilon i \tag{3}$$

$$R_{itf} = \alpha_0 + \alpha_1 \ GTCC_{itf} + \beta \boldsymbol{X} + \varepsilon i \tag{4}$$

where: R_{ite} and R_{itf} are the daily MSCI index return for country i in emerging and frontier countries, respectively, at day t; $GTCC_{\mathrm{ite}}$ and $GTCC_{\mathrm{itf}}$ are the daily growth in confirmed COVID-19 cases for country i in emerging and frontier countries, respectively, at day t; while $\boldsymbol{X}$ is a set of the control factors including GFI_{it} that captures the government financial intervention dummy variable; FSE_{it} that captures the cultural secrecy variable and DC_{it} captures the daily number of confirmed COVID-19 deaths for country i at day t; CC_{it} captures the level of control of corruption in every country in 2019; and a country dummy effect variable to control for difference across countries. Fourthly, we develop two additional models to examine if the impact of government financial interventions is greater in emerging countries compared to frontier ones during the COVID-19 period as shown in Equations 5 and 6:

$$R_{ite} = \alpha_0 + \alpha_1 GFI_{ite} + \beta \boldsymbol{X} + \varepsilon i \tag{5}$$

$$R_{itf} = \alpha_0 + \alpha_1 GFI_{itf} + \beta \boldsymbol{X} + \varepsilon i \tag{6}$$

where: R_{ite} and R_{itf} are the daily MSCI index return for country i in emerging and frontier countries, respectively, at day t; GFI_{ite} and GFI_{itf} are the government financial intervention dummy variables in emerging and frontier countries, respectively, at day t; while $\boldsymbol{X}$ is a set of the control factors including $GTCC_{it}$ that captures the daily growth in confirmed COVID-19 cases for country i at day t; FSE_{it} captures the cultural secrecy variable; DC_{it} captures the daily number of confirmed COVID-19 deaths for country i at day t; CC_{it} captures the level of control of corruption in every country in 2019; and a country dummy effect variable to control for difference across countries. Lastly, we develop two further models to study if the influence of cultural secrecy on equity market returns in frontier market economies is greater than emerging market economies during the COVID-19 period as shown in Equations 7 and 8:

$$R_{ite} = \alpha_0 + \alpha_1 FSE_{ite} + \beta \boldsymbol{X} + \varepsilon i \tag{7}$$

$$R_{itf} = \alpha_0 + \alpha_1 FSE_{itf} + \beta \boldsymbol{X} + \varepsilon i \tag{8}$$

where: R_{ite} and R_{itf} are the daily MSCI index return for country i in emerging and frontier countries, respectively, at day t; FSE_{ite} and FSE_{itf} are the cultural secrecy variable in emerging and frontier countries, respectively; while $\boldsymbol{X}$ is a set of the control factors including GFI_{it} that captures the government financial intervention dummy variables; $GTCC_{it}$ that captures the daily growth in confirmed COVID-19 cases for country i at day t; DC_{it} that captures the daily number of confirmed COVID-19 deaths for country i at day t; CC_{it} that captures the level of control of corruption in every country in 2019; and a country dummy effect variable to control for difference across countries. Table 1 presents definitions of the variables and sources of data

Table 1. Definitions of variables

Variables	Source of Data
Index Returns (R) include daily returns of MSCI index prices from December 1 to April 28, 2020.	**MSCI website**
Government Financial Intervention (GFI) refers to a daily summation of all government intervention policies that have been introduced to support the capital market as a response to the spread of the COVID-19 virus. Policies includes strategies targeting financial institutions, liquidity funding, financial market, and payment supports.	**World Bank website**
Financial Secrecy (FSE) Index denotes to a preference for secrecy and limit of information disclosure related to businesses solely to those who are strictly involved with the administration as opposed to a less mysterious and publicly responsible approach. Gray (1988) designed a secrecy index based on the three dimensions of Hofstede's (2001) national cultural measures of uncertainty avoidance, power distance, and individualism, which are all time-invariant indices that range from a value of 0 to 100 points. A total of 100 (0) points refers to the largest (smallest) degree of uncertainty avoidance, power distance, and individualism in a nation. Gray and Vint (1995) find that when a country's culture is described as having a high level of uncertainty avoidance, power distance, and low level of individualism, then managers tend to be very secretive about financial reporting practices. Thus, we follow Gray and Vint (1995) in adopting the following equation to calculate our FSE index; **Financial Secrecy= uncertainty avoidance + power distance – individualism**	**Hofstede's website**
Growth in Confirmed COVID-19 Cases (GTCC) includes daily observations for countries that record more than 1,000 confirmed COVID-19 cases from December 1 to April 28, 2020.	**EU ODP (2020) website**
Number of Confirmed COVID-19 Deaths (DC) includes daily death observations related to the COVID-19 contagion from December 1 to April 28, 2020.	**EU ODP (2020) website**
Control of Corruption (CC) is a time-variant index that measures the level of public authority is employed for self-gain, including both trivial and significant forms of corruption. CC ranges from 2.5 (strong) to -2.5 (weak) control of corruption.	**The worldwide governance indicators website**
Country Dummy (DC) is a country-specific dummy variable that captures differences across countries.	

5. Empirical Results and Discussion

5.1 Descriptive Statistics

Table 2 reports a variety of descriptive statistical results. The table shows that the daily average of stock market index returns incurs negative price changes for developing, emerging, and frontier countries during the first five months of the COVID-19 contagion. Across our sample, developing, emerging, and frontier economies, on average, introduce 8, 9, and 4 government financial intervention (GFI) policies, respectively. The table also shows that on average developing countries score 107 on the Gray's financial secrecy index while emerging and frontier cultures score 108 and 106, receptively. The average daily growth in the number of confirmed COVID-19 cases reported is 24%, 23%, and 25% in developing, emerging, and frontier countries, respectively. The average number of daily COVID-19 deaths reported is 348, 446, and 60 cases in developing, emerging, and frontier countries, respectively.

Table 2. Descriptive statistics

		Mean R	Mean GFI	Mean FSE	Mean GTCC	Mean DC	Mean CC	Emerging Countries	Frontier Countries	Total Observations
	Developing Countries	-0.001	8	107	0.24	348	0.02-	Yes	Yes	939
	Emerging Countries	-0.001	9	108	0.23	446	0.04-	Yes		729
	Frontier Countries	-0.002	4	106	0.25	60	0.14		Yes	210
1	Argentina	-0.005	14	89	0.26	109	-0.08	Yes		22
2	Brazil	-0.0037	26	107	0.27	1.736	-0.42	Yes		26
3	Chile	0.0037	7	126	0.26	94	1.01	Yes		25
4	China	0.0009	10	90	0.09	3.346	-0.27	Yes		62
5	Colombia	0.0028	6	134	0.29	131	-0.3	Yes		20
6	Czech Republic	-0.003	8	73	0.19	166	0.5	Yes		27
7	Hungary	-0.0094	7	48	0.19	142	0.05	Yes		23
8	Indonesia	-0.003	5	112	0.26	469	-0.25	Yes		21
9	India	0.0021	9	69	0.17	414	-0.19	Yes		43
10	South Korea	-0.0001	19	127	0.13	229	0.6	Yes		51
11	Kuwait	0.0019	1	110	0.15	3	-0.29	Yes		29
12	Mexico	-0.0054	17	133	0.23	449	-0.86	Yes		22
13	Malaysia	0.0007	8	114	0.10	83	0.31	Yes		46
14	Pakistan	-0.0009	4	111	0.29	124	-0.79	Yes		24
15	Peru	-0.0026	10	135	0.36	254	-0.54	Yes		23
16	Philippines	-0.0023	9	106	0.15	349	-0.54	Yes		40
17	Poland	-0.0014	12	101	0.30	286	0.64	Yes		23
18	Qatar	0.002	2	110	0.41	7	0.72	Yes		23
19	Saudi Arabia	-0.0016	6	103	0.16	79	0.25	Yes		27
20	Russian Federation	-0.0005	9	149	0.16	198	-0.85	Yes		39
21	Thailand	0.0013	5	108	0.11	46	-0.4	Yes		49
22	Turkey	-0.0004	11	114	0.58	1518	-0.34	Yes		21
23	Bangladesh	0.0032	11	120	0.21	50	-0.91		Yes	18
24	Bahrain	0.0031	1	110	0.31	7	-0.15		Yes	30
25	Estonia	-0.0004	1	40	0.22	35	1.51		Yes	23
26	Bulgaria	-0.002	6	137	0.22	102	-0.07		Yes	26
27	Croatia	-0.0001	5	120	0.18	34	0.13		Yes	26
28	Lithuania	-0.0009	3	47	0.23	29	0.5		Yes	21
29	Morocco	-0.0111	4	92	0.26	127	-0.22		Yes	22
30	Serbia	-0.0044	7	153	0.34	99	-0.37		Yes	21
31	Slovenia	-0.0009	2	132	0.27	61	0.87		Yes	23
32	United Arab Emirates	0.0011	4	110	0.15	33	1.15	Yes		43

5.2 Empirical Results

Table 3 reports the outcomes after adjusting for heteroscedasticity. Models 1, 2, and 3 report positive and significant coefficients for the variable GFI, government financial intervention across developing, emerging, and frontier stock markets. This provides strong support for Hypothesis 1. These findings show that when governments intervene in their capital markets by introducing financial policies aiming to ease the effect of COVID-19, stock market investors become more assured about the overall stability of the economy. This is to the extent that investors overreact to such positive news resulting in increasing investment activities which in turn increases equity returns. This finding is in line with prior research (Breitenfellner & Wagner 2010; Bond & Goldstein 2015; Chang & Chen 2016; Pasquariello 2018; Zaremba et al. 2020).

Table 3. Empirical results

	Model 1. All Sample	Model 2. Emerging Countries	Model 3. Frontier Countries
GFI	0.013**	0.002**	0.005**
	[2.42]	[2.05]	[1.65]
FSE	0.010	0.014	-0.010
	[0.56]	[0.77]	[-0.048]
GTCC	-0.010***	-0.011***	-0.003
	[-3.01]	[-3.62]	[-1.18]
DC	0.010	0.002**	0.001
	[0.91]	[1.85]	[0.99]
CC	0.010	0.003**	0.004

	[1.05]	[2.17]	[0.18]
Country Dummy Effect	Yes	Yes	Yes
Constant	-0.011	-0.0032	-0.0014
	[-0.50]	[-0.66]	[-0.26]
N	939	725	210
R-squared	0.02	0.03	0.02

Notice: All variables are defined in Table 1. T-statistics are corrected for heteroscedasticity.

Table 3 documents the outcomes for measuring the impact of the coefficient FSE, financial secrecy, on stock market returns at the start of the COVID-19 pandemic. Models 1, 2, and 3 report insignificant results for developing, emerging, and frontier equity markets, so Hypothesis 2 is not supported. The findings imply that differences in the level of cultural secrecy in handling information have no effect on stock market returns during the COVID-19 pandemic in developing, emerging, and frontier economies. Table 3 also reports the results for the coefficient GTCC that examines the relationship between daily growth in the number of confirmed COVID-19 cases and equity market returns. The results confirm that a significant and negative relationship existing in developing and emerging stock markets is shown in Models 1 and 2. These results imply that investment sentiment in developing and emerging economies indeed deteriorates with the increase in the daily number of confirmed COVID-19 cases reported, therefore triggering a negative effect on stock market returns. The findings do support previous research results (Al-Awadhi et al. 2020; Ashraf 2020). Yet, the reported outcome for the coefficient GTCC in frontier economies provides no significant relationship. This means that equity market returns in frontier economies are not affected by the COVID-19 pandemic, so frontier economies offer a valuable investment destination during when the COVID-19 pandemic begins. This outcome offers strong support for Hypothesis 3 confirming that the impact of COVID-19 is greater in emerging countries compared to frontier ones.

Now, we check the result of Hypothesis 4 that studies if the influence of government financial interventions is greater in emerging countries compared to frontier ones during the start of the COVID-19 period. Against our expectation, we find no statistical difference between the coefficient of GFI in emerging and frontier equity markets. Both reported coefficients in Models 2 and 3 in Table 3 are positive and significant (Note 12). This implies that the impact of government financial intervention policies on stock market returns during the beginning of the COVID-19 period is very important yet similar in emerging and frontier stock markets. Table 3 also provides unsupportive outcomes for Hypothesis 5 that examines if the influence of cultural secrecy on equity market returns in frontier stock markets is greater than emerging stock markets during the start of the COVID-19 period. Models 2 and 3 report the results for the coefficient FSE for emerging and frontier equity markets showing that both are insignificant.

Piecing together the reported results in Tables 2 and 3, we provide solid answers to the proposed questions in this paper as follows. Shall investors avoid investing in developing countries where the coronavirus has rapidly spread? Based on our results, the answer is yes. Shall investors avoid investing in developing countries where governments fail to provide financial intervention policies to restore investors' confidence? Based on our results, the answer is also yes. Shall investors avoid investing in developing countries where governments have a history of cultural secrecy in relation to processing market information? Based on our results, the answer is no. Is there a difference in relation to the impact of the COVID-19 pandemic on stock market returns between emerging and frontier stock markets when we incorporate differences in the provided government financial intervention policies and their level of cultural secrecy? Based on our results, the answer is also yes.

Finally, to offer a meaningful and practical understanding of our findings, Table 4 presents a summary of the best and worst stock market investment destinations during the first five months of the COVID-19 contagion while considering the introduced government financial intervention measures across emerging and frontier equity markets. The table shows that investors can enjoy better investment returns in emerging stock markets that have a daily COVID-19 growth below the daily average growth of 0.23 and there are nine and more government financial intervention policies. This includes China, Czech Republic, India, South Korea, Malaysia, and Russian Federation. In contrast, investors should avoid investing in emerging countries that have GTCC growth above the daily average growth of 0.23 and government financial intervention policies amount to less than 9. This includes Chile, Colombia, Indonesia, Pakistan, and Qatar. The table also shows that investors will have valuable investment returns in frontier stock markets that introduce four and more government financial intervention policies. This includes Bangladesh,

Bulgaria, Croatia, Serbia, and Morocco. In contrast, investors should avoid investing in frontier stock markets that introduce less than 4 such policies. This includes Bahrain, Estonia, Lithuania, and Slovenia.

Table 4. Summary of the best and worst stock market investment destinations during the beginning of the COVID-19 pandemic

Best investment destinations in emerging countries	Worst investment destinations in emerging countries
GTCC growth is below the daily average growth of 0.23 and government financial intervention policies equal nine and more.	GTCC growth is above the daily average growth of 0.23 and government financial intervention policies are less than 9.
China, India, South Korea, Philippines, Mexico and Russian Federation	Chile, Colombia, Indonesia, Pakistan, and Qatar
Best investment destinations in frontier countries	**Worst investment destinations in frontier countries**
Government financial intervention policies number more than 4.	Government financial intervention policies number less than 4.
Bangladesh, Bulgaria, Croatia, Serbia, and Morocco	Bahrain, Estonia, Lithuania, and Slovenia

5.3 Discussion

Our results report significant outcomes for the coefficients of government financial intervention policies and daily growth in the number of confirmed COVID-19 cases reported. Therefore, we expect our results to follow the uncertain-information theory established by Brown et al. (1988). The authors expect that a difference in the information content could impact stock returns through differences in equity investors' perceptions, since the valuation of stocks is largely influenced by investors' realization of their future performance. Our outcomes confirm that government financial intervention policies certainly emphasize investors' prospects of governments' devotion to stabilizing the economy. In turn, this enhances investors' confidence and reduces investment uncertainty in equity markets. Therefore, investors welcome governments' financial intervention policies that seek to diminish the impact of COVID-19, which in turns increases investors' investment appetite. The end result is growing demand for stocks and this produces positive stock markets returns.

Brown et al.'s (1988) uncertain-information theory also expects a growing systematic risk of shocks following unexpected equity market event surprises. In this respect, equity market investors deal with the information about growth in the number of confirmed COVID-19 cases reported as unanticipated macroeconomic event surprises. These assuredly have serious consequences for economies and equity markets in developing countries. With the constant increase in the number of confirmed COVID-19 cases reported, investment uncertainty rises as stock market traders understand that governments are likely to take strict actions to stop the spread of the disease, and strategies may influence the stability of stock markets. As stated by Zaremba et al. (2020), some of those actions vary from shutting down workshops and schools to announcing limitations on individuals' mobility and curbing stock market trading activities to limit the spread of the COVID-19 infection. Such government measures have an opposing influence on the economy, and simply worsen investment uncertainty (Goodell 2020; Liu et al. 2020). Consequently, when stock market participants observe an rise in the number of confirmed COVID-19 cases, they rush to sell their stock holdings, fearing additional and stricter government arrangements to curb the spread of the disease, causing equity returns to fall in developing countries' stock markets.

The absence of the influence of the COVID-19 contagion in frontier economies compared to emerging ones is not surprising. This is because one might say that stock market returns in frontier economies are informationally more inefficient compared to emerging ones. In the former market-related information including news about the daily increase in the number of confirmed COVID-19 cases reported is not immediately reflected in stock market prices (Lucey & Zhang 2010). Recall that Fama (1970) develops the efficient market hypothesis (EMH), indicating that in an inefficient equity market, securities' prices cannot "totally and instantaneously reflect" all publicly accessible market information at any given point of time. A number of researchers argue that frontier stock markets suffer from greater stock market inefficiency compared to emerging ones (Islam & Khaled 2005; Sadorsky 2011; Jamaani &

Roca 2015). For this reason, we attribute this difference in stock market informational efficiency to the absence of the impact of the COVID-19 pandemic in frontier economies compared to emerging ones. This means that emerging stock markets are less desirable investment destinations during the COVID-19 calamity.

In addition, the EMH proposes that equity returns could be affected by the unexpected shock of government financial intervention on equity market returns. Stock market returns shall respond to new information properly and in a timely fashion. Therefore, no excessive equity returns should be observed. Quite the opposite, we discover that the introduced government financial intervention policies to the capital markets in emerging and frontier stock markets indeed improve equity returns. This outcome is not surprising because prior research indicates that both emerging and frontier equity markets agonize over stock market inefficiency (Islam & Khaled 2005; Sadorsky 2011; Jamaani & Roca 2015). So, stock market investors in developing economies including the ones in emerging and frontier stock markets overact to government intervention news, where policies are introduced to suppress the impact of the COVID-19 pandemic.

5.4 Robustness Tests

To enhance the consistency of our derived results, we develop six models that create two interaction terms capturing the joint effects of GTCC and GFI and GTCC and FSE in developing, emerging, and frontier stock markets. We also control for the influence of clustering in error terms within countries (Jamaani & Ahmed 2020, 2021). The authors discover that not accounting for the influence of clustering, will lead to the T-statistic values being overstated. Results in most models in Table 5 provide reliable outcomes with the outcomes provided previously in Table 4.

Table 5. Robustness tests

	Model 1 All Sample	Model 2 Emerging Countries	Model 3 Frontier Countries	Model 4 All Sample	Model 5 Emerging Countries	Model 6 Frontier Countries
GFI*GTCC	0.011**	0.002	0.032***			
	[1.75]	[1.16]	[3.10]			
FSE*GTCC				-0.009***	-0.001***	-0.001
				[-3.03]	[-3.62]	[-1.27]
GFI				0.008***	0.002**	0.005**
				[2.46]	[2.07]	[1.65]
FSE	0.010	0.026	-0.010			
	[0.49]	[0.64]	[-0.10]			
DC	0.010	0.004**	0.054	0.010	0.001*	0.001
	[1.18]	[2.12]	[1.09]	[0.83]	[1.54]	[1.05]
CC	0.010	0.029**	0.007	0.011	0.006**	0.035
	[0.98]	[2.58]	[0.32]	[0.83]	[1.90]	[0.23]
Country Dummy Effect	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.014	-0.044	-0.021	0.013	0.053	-0.007
	[-0.63]	[-0.90]	[-0.38]	[0.43]	[0.54]	[-1.20]
N	939	725	210	939	725	210
R-squared	0.01	0.01	0.02	0.02	0.03	0.02

Notice: All variables are defined in Table 1. T-statistics are corrected for heteroscedasticity and clustering in error terms within countries.

6. Conclusion

Extensive research claims that transmittable diseases such as COVID-19 shape equity market returns (Ashraf 2020; Liu et al. 2020). Yet, there is no clear understanding about the role of government financial intervention policies and cultural financial secrecy on stock market returns during the commencement of the COVID-19 pandemic in developing, emerging and frontier stock markets. Hence, this paper aims to offer an understanding of two things - the role of government financial intervention policies and cultural secrecy in processing market information on stock market returns - in these nations during the first months of the COVID-19 virus spread.

We employ global data including 939 observations across 23 emerging and 9 frontier stock markets (32 developing countries) from December 1 to April 28, 2020 to attain robust results. The main results of this paper are summarized as follows. We uncover evidence showing that the introduced government financial intervention measures that were devised to overcome the impact of the disease, work well in improving investors' perception of governments' commitment to stabilizing the economy during the early months of the COVID-19 contagion in developing, emerging, and frontier equity markets. We find that investors in developing equity markets including ones investing in emerging and frontier stock markets disregard differences in cultural secrecy in processing market information. We attain solid results showing that equity market investors in developing and emerging countries indeed react negatively to rising number of confirmed COVID-19 cases. However, the influence of the COVID-19 disease has no effect on equity market returns in frontier stock markets. This means that frontier stock markets can function as a safe-haven investment destination during a global health outbreak. Our study is important for equity investors during such events to understand how to identify the best and worst investment destinations in developing, emerging, and frontier stock markets, while at the same time understanding the important roles of government financial intervention policies and the daily growth of COVID-19 cases on stock market returns.

7. Limitations and Future Research

Our research data only focuses on developing countries including emerging and frontier stock markets from December 1 to April 28, 2020. Thus, future research can validate our attained findings using global data that includes both developed and developing samples while utilizing a longer dataset that goes to Feburary 2021. It should do this to provide a improved understanding of: firstly, the role of government financial intervention policies; and secondly, cultural secrecy in processing market information on stock market returns during the entire COVID-19 disease, which shows no sign of ending soon.

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Notes

Note 1. We are thankful for the generous financial support provided by the Deanship of Scientific Research at Taif University under Grant Number 1-441-62.

Note 2. We follow Gray and Vint (1995) and Pasiouras et al. (2020) in calculating the cultural secrecy score for Lithuania and South Kora based on Gray's Model. Gray (1988) develops a secrecy theory which links transparency in accounting systems and cultural values related to Hofstede's cultural paradigms, finding that culture indeed influences secrecy in financial reporting practices in some countries. Gray defines secrecy as "a preference for

confidentiality and restriction of disclosure of information about the business only to those who are closely involved with its management and financing as opposed to a more transparent, open and publicly accountable approach" (Gray 1988, p. 8). The author designs a secrecy index based on the three dimensions of Hofstede's (2001) cultural measures of uncertainty avoidance, power distance, and individualism. Gray (1988) and Gray and Vint (1995) discover that when a country's culture is characterized as having a high level of power distance, uncertainty avoidance and low level of individualism, then managers tend to be very secretive about financial reporting practices.

Note 3. On the 21st of March 2020 in Uganda, the government required banks to not charge for wallet transactions below UGX 30,000 ($7.50) per day for a period of 30 days. In Pakistan the authorities required banks to waive all charges for online fund transfer services. Likewise, the Argentinian government instructed banks to remove limits on withdrawals at automated teller machines (ATMs). The Brazilian government ordered banks to waive fees on digital channels. Similarly, in Singapore, the government accelerated the use of digital finance and electronic payments to support COVID-19 safe distancing measures (World Bank Group 2020).

Note 4. On the 27th of February, the Malaysian government offered RM 2 billion in working capital loans for SMEs (Small and Medium-Sized Enterprises) influenced by COVID-19. On the 14th of March, the Saudi government offered concessional finance totaling approximately SAR 13.2 billion for SMEs (World Bank Group 2020).

Note 5. On the 3rd of March 2020, Malaysia's government cut the repo (i.e. repurchase agreement) rate by 25 basis points so that it stood at 2.50%. Hong Kong made the repo interest cut of 50 basis points which reached 1.50% as an immediate liquidity policy support. This was implemented to ease the effect of COVID-19 on market liquidity (World Bank Group 2020).

Note 6. On the 21st of March, in Rwanda, the government revised the treasury bonds discounting timeframe for the subsequent six months with an offer to purchase back bonds at the predominant market rate. The waiting timeframe was condensed to 15 days from the current 30 days (World Bank Group 2020).

Note 7. Opponents of government financial interference argue that such interventions simply threaten the integrity of stock markets since equity markets serve as an important financial gauge of the economy. Any meddling with it can convey inappropriate signals about the state of a country's economy (Dabrowski 2010). This may result in damaging investors' assurance in the economy. More precisely, interference contradicts the elementary principles of independent equity markets' functioning which includes price discovery and risk transfer (Ngene et al. 2014). This is because the action of tempering with prices of securities could create information inefficiencies in stock markets, which result in equity markets pricing the risks erroneously and inefficiently (Lucey & Zhang 2010; Khan & Batteau 2011).

Note 8. Hofstede (2001) defines a country with a high degree of power distance as one that allows power and authority to exist only in the hands of a few people or the elites in society.

Note 9. Hofstede (2001) defines a country with a high degree of uncertainty avoidance as one where its citizens strive to evade insecurity, uncertainty, and unpredictability.

Note 10. Hofstede (2001) defines a country with a high degree of individualism as one where its citizens emphasize their right to do as they please, ignore the demands of the common or collective good, and there is a weak emphasis on family connections or cohesion.

Note 11. The categorization of emerging versus developed market economics follows the categorization provided by the MSCI website (MSCI 2020).

Note 12. In unablated results, the results of coefficient difference provide no significant difference between the two coefficients.

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