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The impact of government interventions during the COVID-19 turmoil on Borsa Istanbul

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ABSTRACT

COVID-19, which emerged as of the end of December 2019, proceeded to spread all over the world. On March 11, 2020, the World Health Organization (WHO) declared the disease a pandemic and warned countries to take certain precautions. While governments were taking restrictive measures, they also tried to support the economy. This research analyzes the impact of the Turkish government's interventions against COVID-19 on Borsa Istanbul for the period between March 10, 2020 and April 17, 2020 applying the pooled OLS. The stringency index, containment and health index, and economic support index are used to evaluate the government's responses to the pandemic. According to the findings, the increase in the number of cases negatively affects stock market returns. While social distancing measures taken by the government have a negative impact on stock returns, containment and healthcare policies and economic support packages have a positive effect on stock returns. Lastly, the interaction of the growth in confirmed cases with stringency index, containment and health index and economic support index are respectively examined. The findings are not significant as investors apparently expect that the social distancing measures, healthcare policies, and economic support packages are not adequate to control the pandemic.

COVID-19 çalkantısı sırasında hükümet müdahalelerinin Borsa İstanbul üzerindeki etkisi

ÖZ

Aralık ayı sonu itibariyle ortaya çıkan COVID-19 daha sonra hızla tüm dünyaya yayılmıştır. 11 Mart 2020'de Dünya Sağlık Örgütü (WHO) hastalığın salgın olduğunu ilan ederek ülkeleri bazı önlemler almaları konusunda uyarmıştır. Bu nedenle hükümetler kısıtlayıcı önlemler alırken, bir yandan da ekonomiyi desteklemeye çalışmışlardır. Bu araştırma, 10 Mart 2020 - 17 Nisan 2020 tarihleri arasında COVID-19'a karşı Türk hükümetinin almış olduğu önlemlerin Borsa İstanbul üzerindeki etkisini En Küçük Kareler Yöntemi ile analiz etmektedir. Sıkılık endeksi, muhafaza ve sağlık endeksi ve ekonomik destek endeksi, hükümetin salgına müdahalelerini değerlendirmek için kullanılmıştır. Bulgulara göre vaka sayısındaki artış borsa getirilerini olumsuz etkilemektedir. Hükümetin almış olduğu sosyal mesafe önlemleri borsa getirilerini olumsuz etkilerken, muhafaza ve sağlık politikaları ile ekonomik destek paketleri ise borsa getirileri üzerinde olumlu etki oluşturmaktadır. Son olarak vakalardaki artışın sıkılık endeksi, muhafaza ve sağlık endeksi ve ekonomik destek endeksi ile etkileşimi sırasıyla incelenmiştir. Yatırımcıların sosyal mesafe önlemlerinin, muhafaza ve sağlık politikalarının ve ekonomik destek paketlerinin pandemiyi kontrol altına almak için yeterli olmadığına yönelik beklentilerinden dolayı sonuçlar anlamlı çıkmamıştır.

1. Introduction

Globalization has provided countries and businesses with many opportunities and has led to tremendous growth in global trade. On the other hand, it creates various threats for countries, especially in terms of increasing geopolitical risks in the last two decades (Drori, Meyer, and Hwang, 2006; Presenza and Sheehan, 2018; Sharma, Leung, Kingshott, Davcik, and Cardinali, 2020). It has both expanded the limits of opportunities and eliminated the limits of risks (Cohen-Tanugi, 2008; Steger, 2003). An incident that occurs anywhere in the world might influence the rest of the world (M. Gupta et al., 2020). COVID-19, a health crisis, is the most striking example of how a crisis turns into a global economic shock via the interconnectedness of countries that underpins globalization (United Nations, 2020).

The World Economic Forum's Global Risk Report, published on January 15, 2020, stated that all the five risks most likely to arise related to environmental issues. *"Infectious diseases"* ranked 10th in terms of impact. This forecast of likely events was dramatically disproven after just a few weeks (Ramelli and Wagner, 2020). The economic system, which continued in its normal course as of the end of December 2019, entered a complex environment with the World Health Organization's announcement of an international public health emergency on January 30, 2020, and of a pandemic on March 11, 2020. This situation created a tremendous shockwave of uncertainty similar to that of the Great Depression (Baker, Bloom, Davis and Terry, 2020; Cavlak, 2020). Although it was initially seen as a "Chinese problem" and then an "Italian problem," eventually it became "a problem for everybody and every country or a global problem" in other words (Baldwin and Mauro, 2020; Chen et al., 2020).

COVID-19 is the last of a sequence of crises (the dot-com bubble, Global crisis, and the Eurozone crisis) that unsettled the first two decades of the 21st century, but it differs from those crises in many ways. The difference is due to the pandemics' creation of an uncertain environment similar to that caused by war and the consequent simultaneous sharp declines in demand and supply (Hermes, 2020; Fernandes, 2020; IMF, 2020; Vidya and Prabheesh, 2020).

COVID-19, which led to one of the deepest global recessions, also represents a humanitarian, and social crisis (Mishra, 2020; World Bank, 2021). The pandemic has led to significant changes in the activities of both consumers and firms (Alon, 2020; Donthu and Gustafsson, 2020; Şişmanoğlu, 2020). It has led to a deterioration in financial markets, cuts in labor and supply chains, a decrease in investment contracts, shrinking consumption, investment and production, and an increase in corporate bankruptcies. As a result, it placed significant pressure on the financial system and many sectors, especially industry, tourism, aviation, agriculture, construction, retail, hospitality and leisure textiles, and fast-moving consumer goods (Debata, Patnaik, and Mishra, 2020; Donthu and Gustafsson, 2020; Elenev, Landvoigt, and Van Nieuwerburgh, 2020; Karmaker et al., 2021; McKinsey and Company, 2020; Topcu and Gulal, 2020).

Governments and policymakers are the central actors in responding to these negative impacts of the pandemic (S. Cheng, Barceló, Hartnett, Kubinec and Messerschmidt, 2020; S.Gupta et al., 2020). The uncertainties and risks created by the pandemic make it difficult for them to formulate appropriate macroeconomic policies (McKibbin and Fernando, 2020). Therefore, it is of great importance for these actors to evaluate both the social and economic impacts of the pandemic (Baker et al., 2020; M. Gupta et al., 2020; Hale, Angrist, Cameron-Blake, Hallas, Kira, Majumdar and Webster, 2020). Factors such as business closures (disrupting labor markets and causing higher-than-anticipated work-hour losses (International Labour Organization - ILO, 2020)), tax revenue declines and increases in government expenditures. Harari and Keep (2020) have also put governments under significant pressure (Clemens and Veuger, 2020; McKee and Stuckler, 2020).

In the first stage, governments implemented emergency action plans such as social distancing measures, public awareness programs, quarantine policies, and income support packages to prevent the healthcare system from collapsing and slow down the spread of disease (Ashraf, 2020a; Susam, 2020). As a second step, various policies (exceptions, tax deferrals, incentives and support packages, etc.) are implemented by governments and central banks to mitigate the negative economic effects (Debata et al., 2020; Harari and Keep, 2020). Thus, unprecedented support has been provided to households, firms, and financial markets. In addition, as the pandemic caused sharp deteriorations in firms and banks' balance sheets, governments intervened in credit markets and prevented a much deeper crisis by reducing bankruptcies (Elenev et al., 2020). However, it remains uncertain whether these stimulus and support packages are sufficient (Gopinath, 2020). The results of the policies implemented, and whether they are effective or not are remain to be revealed through academic studies (Cheng et al., 2020).

In this study, the effects on Borsa Istanbul of the social distancing measures, healthcare policies and economic support packages announced by the Turkish government are analyzed. The stringency index, containment and health index and economic support index are used as the proxy, respectively. The results of the analysis indicate that the social distancing measures taken by the government negatively affected stock market returns, while the healthcare policies and economic support packages had a positive effect on Borsa Istanbul. To the best of our knowledge, no study has yet been conducted specifically on Borsa Istanbul, to analyze the effect of government interventions and we want to fill this gap in the literature.

In the second part of the study, the literature and related hypotheses are mentioned. Then, the data and methodology used in the study are explained. Section 4 reports detailed empirical results and discussions of findings. In the last section, we conclude the study in line with the findings.

2. Literature review and hypotheses development

In this section, we introduce our testable hypotheses concerning the effect of the government's social distancing measures, containment and healthcare policies and economic support packages on Borsa Istanbul.

The measures, such as travel bans, restaurant closing, and lockdowns may have a direct or indirect effects on the stock returns as they reduced economic activity. Barrot, Grassi, and Sauvagnat (2020) estimated that a 10% increase in labor restriction led to a 3% decline in employment, and a 1.87% decline in the market value of firms only in April 2020. Ashraf (2020a) investigate the impact of social

distancing measures taken by the government on stock returns. Using daily data from 77 countries, the research showed that governments' announcements about social distancing measures had a direct negative impact on stock market returns due to their negative consequences for economic activity, despite an indirect positive effect through a reduction in COVID-19 cases. Yang and Deng (2021) also find the same results for 20 OECD countries. Based on the literature, we write our first hypothesis:

Hypothesis 1: The announcement of stringency against COVID-19 causes a decrease in stock market returns.

The measures taken by the government regarding containment and healthcare policies may positively affect stock returns. In order to control pandemics and have a developed healthcare system in country, it is essential to raise society's awareness of cleanliness, testing and contact. Ashraf (2020a) found that containment and healthcare policies positively affects stock returns. Hence, we generate our second hypothesis as follows:

Hypothesis 2: The announcement of government containment and healthcare policies leads to an increase in stock market returns.

Increasing interventions due to the growth in the number of cases adversely affected the economy. In particular, tourism, transportation, hotels and restaurants are negatively influenced (Kandil Göker, Eren, and Karaca, 2020; Keleş, 2020; Kilic, 2020). These interventions affect both employers and employees with the closure of the workplaces for a certain period. In this case, direct cash support or cheap loans could have a positive effect on stock returns. Ashraf (2020a) revealed that economic support incentives and packages positively contribute to stock returns. Based on the discussion, we form our final hypothesis:

Hypothesis 3: The announcement of economic support packages leads to an increase in stock market returns.

3. Data and methodology

3.1. Data

In this study, the effects of the government interventions on Borsa Istanbul (Table 1) are analyzed from March 10, 2020, to April 17, 2020. The first COVID-19 cases in Turkey were announced on March 10, 2020. The government immediately closed schools, restaurants, and canceled football matches. Social distancing measures were taken to prevent the spread of the disease, and supportive packages were announced for the economy. Table 2 indicates the first days of the COVID-19 process chronologically in Turkey. The explanation for selecting the last day as April 17 is that, while the uncertainty persisted as of mid-April, the financial markets start to recover to some degree (Cepoi, 2020) and studies in the literature consider April 17, 2020 as the last day (Ashraf, 2020a, 2020b, 2020c; Baig, Butt, Haroon, and Rizvi, 2020; Cepoi, 2020). After deducting weekdays, we have balanced panel data covering 29 working days for each sectoral index.

Table 1

Sample information for Borsa Istanbul sectoral indices

Index	Code	Obs.	Start Date	End Date
BANK	XBANK	29	10.03.2020	17.04.2020
BASIC METAL	XMANA	29	10.03.2020	17.04.2020
CHEMICALS, PETROL, PLASTIC	XKMYA	29	10.03.2020	17.04.2020
CORPORATE GTV	XKURY	29	10.03.2020	17.04.2020
ELECTRICITY	XELKT	29	10.03.2020	17.04.2020
FOOD & BEVERAGE	XGIDA	29	10.03.2020	17.04.2020
HOLDING & INV	XHOLD	29	10.03.2020	17.04.2020
INFO TECHNOLOGY	XBLSM	29	10.03.2020	17.04.2020
INSURANCE	XSGRT	29	10.03.2020	17.04.2020
INV TRUSTS	XYORT	29	10.03.2020	17.04.2020
LEASING & FACTORING	XFINK	29	10.03.2020	17.04.2020
METAL PRODUCTS	XMESY	29	10.03.2020	17.04.2020
FINANCIALS	XUMAL	29	10.03.2020	17.04.2020
INDUSTRIAL	XUSIN	29	10.03.2020	17.04.2020
SERVICES	XUHIZ	29	10.03.2020	17.04.2020
TECHNOLOGY	XUTEK	29	10.03.2020	17.04.2020
NON-METAL MRL PRODS.	XTAST	29	10.03.2020	17.04.2020
REAL ESTATE INV. TRUST	XGMYO	29	10.03.2020	17.04.2020
SPORTS	XSPOR	29	10.03.2020	17.04.2020
TEXTILE & LTHR	XTEKS	29	10.03.2020	17.04.2020
TOURISM	XTRZM	29	10.03.2020	17.04.2020
TRANSPORTATION	XULAS	29	10.03.2020	17.04.2020
WHSL & RETAIL TRADE	XTCRT	29	10.03.2020	17.04.2020
WOOD, PAPER & PRINT	XKAGT	29	10.03.2020	17.04.2020

Table 2

The timeline of COVID-19 in Turkey

10.03.2020: First COVID-19 case in Turkey
10.03.2020: WSO declared COVID-19 to be a pandemic
12.03.2020: Schools were closed. Football matches were canceled
17.03.2020: First death
18.03.2020: Number of cases passed 100
18.03.2020: First economic support package declared
21.03.2020: Flights were cancelled with 46 countries
21.03.2020: Number of cases passed 1000
28.03.2020: Number of deaths passed 100
10.04.2020: Number of deaths passed 1000
15.04.2020: Second economic support package declared

Source: Keleş (2020)

To analyze the government's reactions to COVID-19, three main indices – the stringency index, containment and health index and economic support index- are utilized ,provided by the Oxford COVID-19 Government Response Tracker database (Hale et al., 2020). The stringency index gives information on social distancing measures and is coded from eight indicators, including school closings, workplace closings, cancellations of public events, restrictions on gathering size, closing public transports, stay at- home requirements, restrictions on internal movement, and restrictions on

international travel. The containment and health index are coded from three indicators, public awareness campaigns, testing policy and contact tracing. The economic support index is coded from two indicators, government income and the household debt/contract relief programs. These indices are rescaled to create a score between 0 and 100. Detailed information about indices is given in Table 3. All data are obtained from Thomson Reuters.

Table 3

Definition of variables

Variables	Description	Source
Index Returns	Daily index returns are calculated. *R$_{i,t}$ = (Price Index$_t$ – Price Index$_{t-1}$)/Price Index$_{t-1}$)*. R$_{i,t}$ is the index return at day t for index i.	Thomson Reuters DataStream
Growth in Confirmed Cases	The daily growth rate at COVID 19 confirmed cases for Turkey calculated as *(Cases$_t$ – Cases$_{t-1}$ / Cases$_{t-1}$)*.	Thomson Reuters DataStream
Stringency Index	This index is based on different government interventions and rescaled to create a score between 0 and 100 (strict=100). The index covers eight policy indicators including, school closing, workplace closing, cancellation of public events, restrictions on gathering size, closing public transport, staying at home requirements, restrictions on internal movement, and restrictions on international travel. We measure a daily change of this variable as *(Stringency Index$_t$ - Stringency Index$_{t-1}$)*	Thomson Reuters DataStream
Containment and Health Index	This index is coded from 3 indicators representing public awareness campaigns, testing policy and contact tracing. The index varies from 0 to 100. We measure a daily change of this variable as *(Containment and Health Index$_t$ - Containment and Health Index$_{t-1}$)*	Thomson Reuters DataStream
Economic Support Index	This index is constructed from 2 indicators including, the government income and debt/contract relief for the household program. This index varies from 0 to 100. We measure a daily change of this variable as *(Economic Support Index$_t$ – Economic Support Index$_{t-1}$)*	Thomson Reuters DataStream

3.2. Methodology

Based on the literature, we generate our model in line with (Ashraf, 2020a, 2020b, 2020c). According to the F-test result, which is no significant at 5% level, it is applied pooled OLS.

We use the following equation (1) as a model:

$$R_{it} = \beta_0 + \beta_1\big(COVID-19_{i,t-1}\big) + \beta_2\big(\Delta GovernmentResponse_{i,t}\big) + \ni_{it;} \qquad (1)$$

in where *R* is the daily return of each index at day *t* for index *i*. *R* is calculated as (Price Index$_t$ – Price Index$_{t-1}$) / Price Index$_{t-1}$. *COVID-19* is the growth in confirmed cases and calculated as *(Cases$_t$ – Cases$_{t-1}$) / Cases$_{t-1}$)*. *Government Response* represents the stringency index, containment and health index and economic support index respectively and calculated as *(Government Response$_t$ – Government Response$_{t-1}$)* and $\ni_{it}$ is an error term. We modify and extend the equation *(1)* and include the interaction of each index with the growth in confirmed cases separately.

$$R_{it} = \beta_0 + \beta_1\big(COVID-19_{i,t-1}\big) + \beta_2\big(\triangle GovernmentResponse_{i,t}\big) + \beta_3\big(\triangle StringencyIndex_{i,t}\big)\, x \big(COVID-19_{i,t-1}\big) + \ni_{it;} \qquad (2)$$

$$R_{it} = \beta_0 + \beta_1\big(COVID-19_{i,t-1}\big) + \beta_2\big(\triangle GovernmentResponse_{i,t}\big) + \beta_3\big(\triangle CotainmentandHealthIndex_{i,t}\big)\, x \big(COVID-19_{i,t-1}\big) + \ni_{it;} \qquad (3)$$

$$R_{it} = \beta_0 + \beta_1 (COVID-19_{i,t-1}) + \beta_2(\triangle GovernmentResponse_{i,t}) + \beta_3(\triangle$$
$$EconomisSupportIndex_{i,t}) \, x \, (COVID-19_{i,t-1}) + \ni_{it;} \qquad\qquad (4)$$

4. Empirical findings and discussions

Table 4 indicates the descriptive statistics for the variables. The average of return indices is *-0.03* with a *0.042* standard deviation. The average growth in confirmed cases is *0.309*, which means observed confirmed cases increased by about 30% daily. It is first tested whether variables are stationary by applying Im, Pesaran and Shin (IPS) (2013) panel unit root test, which is given Annex Table 1. The null hypothesis for this test is the existence of the unit root. The results indicate that the null hypothesis is rejected for all variables. Put differently; all variables are stationary at 1% significance level. Second, it is applied diagnostic tests (Annex Table 2) to choose the best method among pooled OLS, fixed effects, and random effects. According to the test results, pooled OLS is a valid model for all models, and all models have heteroskedasticity problems, so it is used robust standard errors.

Table 5 shows the empirical results. According to Model 1, with the growth in confirmed cases, the effect on stock returns is negative and significant. This result is consistent with previous findings (Al-Awadhi, Alsaifi, Al-Awadhi and Alhammadi, 2020; Ashraf, 2020a, 2020b, 2020c; Lee, Jais, and Chan, 2020). Under all models, the impact of confirmed cases is negative for returns. Model 2 includes the growth in confirmed cases and the three indices. There is a negative and significant relationship between the stringency index and stock returns. Social distancing measures taken by the government to prevent the spread of the disease have a negative effect on the market. A decrease in both consumption and production due to social (distancing rules negatively affects stock returns (Ashraf, 2020a, 2020b, 2020c; M. Chen, Demir, Garcia-Gomez and Zaremba, 2020). This result confirms our *Hypothesis 1*.

Both containment and healthcare policies and the economic support packages have a positive and significant effect on returns (Ashraf, 2020a), consistent with our *Hypotheses 2 and 3*. However, the coefficient and significance of economic support packages are lower. The reason for this might be the methodology of the index, which measures household support rather than support for firms (Ashraf, 2020a). Finally, the interaction of *(growth in confirmed cases X stringency index), (growth in confirmed cases X containment and health index) and (growth in confirmed cases X economic support index)* are analyzed respectively. According to the three models, the results are not significant. These results imply that investors do not expect the social distancing measures, healthcare policies, and economic support packages to sufficiently contain the disease.

Table 4

Descriptive statistics

Variables	N	Mean	Std. Dev.
Index Returns	696	-0.003	0.042
Growth in Confirmed Cases	696	0.309	0.355
Stringency Index	696	1.883	5.474
Containment and Health Index	696	1.540	4.474
Economic Support Index	696	2.083	7.966

Table 5

Empirical results

Variables	1	2	3	4	5
Growth in Confirmed Cases	-0.0047**	-0.0169***	-0.0155**	-0.0155**	-0.0169***
	(0.0020)	(0.0054)	(0.0056)	(0.0056)	(0.0054)
Stringency Index		-0.4550***	-0.4580***	-0.4590***	-0.4560***
		(0.118)	(0.105)	(0.105)	(0.118)
Containment and Health Index		0.5620***	0.5670***	0.5671***	0.5620***
		(0.144)	(0.128)	(0.129)	(0.145)
Economic Support Index		0.00057*	0.00060*	0.00059*	0.0001
		(0.0003)	(0.0003)	(0.0003)	(0.0001)
Growth in Confirmed Cases * Stringency Index			-0.0017		
			(0.0003)		
Growth in Confirmed Cases * Containment and Health Index				-0.0002	
				(0.0004)	
Growth in Confirmed Cases * Economic Support Index					0.0001
					(0.0004)
Constant	0.0065	0.0064	0.0048	0.0049	0.0063
	(0.0102)	(0.0113)	(0.0106)	(0.0106)	(0.0113)
Observations	696	696	696	696	696
Prob > F	0.000	0.000	0.000	0.000	0.000
R^2	0.039	0.171	0.173	0.174	0.174

Note: Growth in confirmed cases is measured as the number of daily observed cases in Turkey. The stringency index gives information on social distancing measures and coded from eight indicators, including school closing, workplace closing, cancellation of public events, restrictions on gathering size, the closing of public transport, staying at home requirements, restrictions on internal movement, and restrictions on international travel. The containment and health index coded from three indicators, including public awareness campaigns, testing policy and contact tracing. The economic support index is coded from two indicators containing the government income and debt/contract relief for the household program. Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

5. Conclusion

As of the end of December 2019, the novel coronavirus, which first appeared in China, spread rapidly, and affected the whole world. Since the announcement of the first case in Turkey on March 10, 2020, the government has tried to prevent the spread of the disease by taking certain measures. In this study, the effect on Borsa Istanbul of the government's interventions against the pandemic is examined. Three indices provided by the Oxford COVID-19 Government Response Tracker database (Hale et al., 2020) are used the stringency index, containment and health index and economic support index to measure the effects of government interventions. According to the results, with the growth in confirmed cases, the effect on stock returns is negative and significant. The stringency index has a negative effect on returns. Social distancing measures taken by the government to prevent the spread of the pandemic have a negative effect on the index. Announcements of government containment and healthcare policies and economic support packages have a positive and significant effect on returns. Lastly, the interaction of growth in confirmed cases with stringency index, containment and health index and economic support index are analyzed respectively. The results are not significant as investors apparently anticipate that the social distancing measures, healthcare policies, and economic support packages are not enough to contain the disease. To the best of our authors' knowledge, this is the first to analyze the government interventions during the COVID-19 turmoil on Borsa Istanbul. We

want to full this gap in the literature. The results of the analysis show that in unprecedented shocks, the interventions of governments can affect the way of stock markets.

Author statement

1. Research and publication ethics statement

This study has been prepared in accordance with the ethical principles of scientific research and publication.

2. Approval of Ethics Board

Ethics Committee Approval is not required for this study.

3. Conflict of interest

There is no conflict of interest arising from the study for the authors or third parties.

4. Declaration of support

No support has been granted for this study

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Appendix

Table 1
Panel Unit Root Test Results

	Level
Variables	Im, Pesaran and Shin (IPS)
Index Returns	-19.5199***
Growth in Confirmed Cases	-24.4178***
Stringency Index	-24.4247***
Containment and Health Index	-24.4932***
Economic Support Index	-24.4408***

*** $p < 0.01$, ** $p < 0.05$,   * $p < 0.1$

Table 2

Diagnostic Tests

Tests	Model	Pooled OLS or Fixed Effects	Pooled OLS or Random Tests	POLS	Option
F-test Score test Breusch and Pagan Multiplier White's test (heteroskedasticity)	1	F test that all u_i = 0: F (24, 699) = 0.11 Prob > F = 1.0000 Sigma u = 0: $chi^2_{(1)}$ = 0.00 Prob > = chi^2 = 1.000	Prob > $chibar^2$ = 1.0000	Prob > chi^2 = 0.0077	robust SE
F-test Score test Breusch and Pagan Multiplier White's test (heteroskedasticity)	2	F test that all u_i = 0: F (24, 699) = 0.11 Prob > F = 1.0000 Sigma u = 0: $chi^2_{(1)}$ = 0.00 Prob > = chi^2 = 1.000	Prob > $chibar^2$ = 1.0000	Prob > chi^2 = 0.0000	robust SE
F-test Score test Breusch and Pagan Multiplier White's test (heteroskedasticity)	3	F test that all u_i = 0: F (24, 699) = 0.11 Prob > F = 1.0000 Sigma u = 0: $chi^2_{(1)}$ = 0.00 Prob > = chi^2 2 = 1.000	Prob > $chibar^2$ = 1.0000	Prob > chi^2 = 0.0000	robust SE
F-test Score test Breusch and Pagan Multiplier White's test (heteroskedasticity)	4	F test that all u_i = 0: F (24, 699) = 0.11 Prob > F = 1.0000 Sigma u = 0: $chi^2_{(1)}$ = 0.00 Prob > = chi^2 = 1.000	Prob > $chibar^2$ = 1.0000	Prob > chi^2 = 0.0000	robust SE
F-test Score test Breusch and Pagan Multiplier White's test (heteroskedasticity)	5	F test that all u_i = 0: F (24, 699) = 0.11 Prob > F = 1.0000 Sigma u = 0: $chi^2_{(1)}$ = 0.00 Prob > = chi^2 = 1.000	Prob > chibar2 = 1.0000	Prob > chi^2 = 0.0000	robust SE