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Araştırma Makalesi

THE MACROECONOMIC DETERMINANTS OF THE STOCK MARKET RETURNS OF TURKISH MANUFACTURING FIRMS: THE COVID-19 PANDEMIC PERIOD

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Abstract

This study explores the impacts of the exchange rate, consumer confidence, oil prices on the stock returns of the Borsa Istanbul (BIST) manufacturing firms for the timeline aftermath of the Covid-19 pandemic (March 2020 – September 2022). As the manufacturing companies comprise the majority of the stock market of the BIST, the composite index of these industrial companies (XUSIN) is selected as the response variable. Implementing the autoregressive distributed lag (ARDL) bounds-testing methodology on the monthly time series data, the cointegration existence is detected among the series. The empirical results also show that oil price is the most significant determinant among these variables affecting manufacturing companies' returns for the long-run. When considering oil as a vital production input in industries, the decreases in stock prices resulting from oil price rises (i.e. increases in production costs) are inevitable. However, the significant long-run effects of exchange rates and the consumer confidence index on stock returns of this industry cannot be detected for the Covid-19 period.

Keywords: *Stock Market, Exchange Rates, Consumer Confidence, Oil Prices, BIST.*

TÜRKİYE'DE İMALAT SEKTÖRÜNDEKİ ŞİRKETLERİN HİSSE SENEDİ GETİRİLERİNİ ETKİLEYEN MAKROEKONOMİK FAKTÖRLER: COVİD-19 PANDEMİ DÖNEMİ

Öz

Bu çalışma Borsa Istanbul (BIST) bünyesinde işlem gören imalat sektöründe yer alan şirketlerin hisse senedi getirileri üzerindeki döviz kurunun, tüketici güveninin ve petrol fiyatlarının etkilerini Covid-19 pandemi dönemi ve sonrası (Mart 2020 – Eylül 2022) için

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Bu çalışma için etik kurul onayı gerekmemektedir.

araştırmaktadır. İmalat sektöründeki firmalar, BIST hisse senedi piyasasının büyük bir bölümünü oluşturduğu için bu şirketlerin kompozit endeksi olan BISTSINAI endeksi bağımlı değişken olarak seçilmiştir. Gecikmesi dağıtılmış otoregresif (autoregressive distributed lag - ARDL) sınır testi yönteminin aylık zaman serilerine uygulanması ile değişkenler arasında eşbütünleşme ilişkisi tespit edilmiştir. Ampirik bulgular aynı zamanda uzun dönemde petrol fiyatlarının hisse senedi getirileri üzerinde en çok etkiyi yapan değişken olduğuna işaret etmektedir. İmalat sektöründe petrolün en önemli üretim girdilerinden biri olduğu göz önüne alındığında, petrol fiyatlarında oluşan artış dolayısıyla üretim maliyetlerinde meydana gelen artışın hisse senedi fiyatlarını olumsuz yönde etkilemesi kaçınılmaz olmaktadır. Diğer taraftan, bu sektörün hisse senedi getirileri üzerinde döviz kurunun ve tüketici güveninin uzun dönemli ve istatistiksel olarak anlamlı etkileri bulunamamıştır.

Anahtar Kelimeler: *Hisse Senedi Piyasası, Döviz Kuru, Tüketici Güveni, Petrol Fiyatları, BIST.*

INTRODUCTION

The factors having predictive power on the stock market prices have been well documented in the finance literature. However, the outbreak of coronavirus disease known as the Covid-19 pandemic adversely influences not only health and social environments but also financial markets and economies (Harjoto et al., 2021). Hence, the re-examination of the determinants of the fluctuating stock prices particularly during the Covid-19 period can contribute to the existing literature by offering recent empirical findings. The study mainly focuses on the impacts of exchange rates, oil prices, and consumer confidence on manufacturing companies' stock returns over the period following the aftermath of the Covid-19 pandemic. Economic uncertainty due to the recent pandemic has led to high fragility and fluctuations in exchange rates (Çütçü & Dineri, 2021). Oil prices have been also affected by the Covid-19 pandemic (Narayan, 2020). In addition, quarantines caused by the disease caused job losses and decreases in wages and incomes, which has reduced the confidence of households and changed their optimistic behavior regarding the economy (Elmassah et al., 2022).

The stock market prices can be differently influenced by the fluctuations in exchange rates, oil prices, and alterations in consumer confidence. Exchange rate is a significant macroeconomic variable that is widely used in the literature (Kwon & Shin, 1999; Phylaktis & Ravazzolo, 2005; Liu & Wan, 2012; Zeren & Koc, 2016). A country's international trade affects the country's stock prices via exchange rates. As the domestic currency depreciates over other currencies, this increases the exports of the country. However, when the inputs used in the production are imported, this raises domestic prices of imported capital and intermediate goods. Thus, if imported goods are more dominant in the country's international trade, then the companies heavily engaged in imported goods are adversely affected by the exchange rate fluctuations (Ibrahim & Aziz, 2003). Additionally, the portfolio flows, investment decisions, and profitability of the firms are considerably affected by the fluctuations of the foreign exchange rates due to the increasing opportunities for international

investment resulting from globalization (Aydemir & Demirhan, 2009). Furthermore, crude oil prices have a critical role in stock market returns particularly in industrial economies (Boyer & Filion, 2007; Miller & Ratti, 2009; Bildirici & Badur, 2019). Without balancing the oil supply, a rise in oil demand brings about higher oil prices, generating an inflationary effect on householders and producers. Higher oil prices decrease the disposable income of householders left to spend on other goods and services. On production side, it increases the costs in the non-oil producing companies, hence decreasing profits and dividend payments which are basic drivers of the share prices. Furthermore, unexpected fluctuations in the supply and demand of oil, and other oil-related agreements (under OPEC) can increase the risk and volatility of future oil prices. Therefore, increasing uncertainty and risk triggers a downturn in investment and wealth, which depresses stock prices (Basher & Sadorsky, 2006). In particular, if a country is a net oil importer, the country's stock price returns are anticipated to depress due to rises in the costs of production resulting from upsurge in oil prices (Kandir, 2008). However, the linkage among oil prices and stock market returns does not work in such manner in some empirical cases, which makes the influence of oil prices on the stock market re-examined by many researchers. Other than the macroeconomic variables such as exchange rates and oil prices, the stock markets are also influenced by human behaviors. Investors make decisions depending on their motivations and sentiments. Therefore, authority bodies such as governmental and economic units put special effort into controlling and managing the perceptions of investors (Kale & Akkaya, 2016). The confidence of investors about the economy is a good explanatory variable reflecting their behaviors in the financial markets (Bildirici & Badur, 2009). A rise in confidence in the economy positively affects the macroeconomic variables such as increasing demand and investments, which can be also observed in the equity markets (Gormuş & Gunes, 2010).

This study mainly examines the impacts of the exchange rate, oil price, and consumer confidence on Turkish manufacturing firms' stock returns for the timespan covering the aftermath of the Covid-19 pandemic (March 2020-September 2022). Since the manufacturing sector mainly constitutes the majority of the stock market in Turkiye (i.e. Borsa Istanbul-BIST), and this sector index reflects the status of the real economy more when compared to other industries such as financial, and technology. Therefore, the composite index of manufacturing companies in BIST (XUSIN) is selected as a dependent variable. In addition, the manufacturing sector is affected mainly by the changes in exchange rates (as the cost of imported intermediate goods), consumer confidence and oil prices. As for methodology, the ARDL bounds-testing is utilized since this method can be applied to variables having different orders of integration (Pesaran, et al., 2001; Pesaran & Pesaran, 2009). Considering the severe reactions of the Covid-19 pandemic as a recent worldwide crisis, inspecting the factors driving stock market returns of the manufacturing industry of BIST for the given period offers recent empirical findings to enrich the existing literature.

LITERATURE REVIEW

The factors affecting the stock market returns are investigated thoroughly by many researchers. The fluctuations in exchange rates are considered a critical source affecting stock price returns. The literature offers mixed results regarding the effects of changing exchange rates on stock price returns. Zeren and Koç (2016) investigate the dynamic association between exchange rates and stock market indices of Turkiye, Japan, and England. The timeline ranges from January-1990 to April-2013. Their results prove that exchange rate and stock price linkage exists for all three countries. Besides, they claim that this relationship strengthens during both local and global crises in each country. Kwon and Shin (1999) offer that domestic currency depreciation negatively affects the Korean stock market. Maysami and Koh (2000) claim that domestic currency depreciation increases the cost of imported intermediate goods used in production, which brings unfavorable news to the stock market and depresses the stock prices in Malaysia. Similarly, Ibrahim and Aziz (2003) detect a negatively correlated link between the exchange rate and stock price returns for Malaysia from January 1997 to August 1998 using monthly data. Aydemir and Demirhan (2009) also find a negative impact of the exchange rate on the main stock indices in Istanbul Stock Exchange for the period of February 2001-January 2008 by employing the Toda and Yamamoto approach. On the other side, some empirical studies prove the positive association between exchange rates and stock market returns. Kandir (2008) investigates the factors affecting the stock portfolio returns in Turkiye including the exchange rates for the period of 1997:07-2005:06. The results point out that the impact of the exchange rate on the export volume is overwhelming, which brings about increasing stock market returns due to the depreciation of the domestic currency. Suriani et al. (2015) provide empirical findings that there exists no link between the returns of the exchange rate and the stock market in Pakistan throughout 2004:01-2009-12 period.

As for the association between oil and stock prices, Jones and Kaul (1996) find a strong response of stock prices in the United States and Canada to dramatic oil price changes. Yet, the reactions in the United Kingdom and Japan to oil price fluctuations are found as less sensitive. Basher and Sadorsky (2006) detect a positive and intense relationship between oil prices and stock market returns of emerging market economies. Miller and Ratti (2009) offer empirical findings that stock market returns react negatively to a rise in crude oil prices in six OECD countries for the periods of 1971:M01–1980:M05 and 1988:M02–1999:M09. This study also offers various results for different periods in other countries. Similarly, Wei and Guo (2017) find that Chinese stock price returns are negatively affected by oil price fluctuations for the two timelines of 1996:02-2006:12 and 2007:01-2015:10 implementing the structural VAR model. Kandir (2008) investigates the effect of changing oil prices on the stock portfolio returns for the 1997:07-2005:06 time period in Turkiye, and provides empirical evidence that there exists no significant effect of oil prices on the stock returns for the given timeline. Bildiri and Badur

(2019) claim that oil price shocks considerably affect the stock prices of both American and Turkish energy firms.

When considering the consumer confidence effects on the financial markets, Gormus and Gunes (2010) examine the impact of consumer confidence on the Turkish equity prices and exchange rate over the timeline from January 2002 to December 2008. They assert that there exists no cointegration among these variables according to ARDL-bounds testing results. However, according to their OLS model results, an increase in both the real exchange rate and confidence significantly raises stock prices. Celik et al. (2010) search for the link among stock market returns, exchange rates, and CCI in Turkey over the 2008 Global Financial Crisis period. They assert that there exists a cointegration between these variables, and rises in both stock market return and exchange rate lead to decreases in CCI in Turkey. Kale and Akkaya (2016) reveal that CCI is not a leading indicator for the stock market returns of BIST100, and indices of finance, service, industry, and technology, while stock market returns positively affect the CCI for the time span of 2004:01-2015:06. Eyüboğlu and Eyüboğlu (2018) investigate the relationship among CCI and eighteen stock market indices in BIST for the period of 2006:01-2016:11. They use ARDL and Toda Yamamoto causality methods and conclude that a long-run linkage exists between CCI and stock market indices. Additionally, increases in CCI result in rises in nine BIST indices including food, textile, non-metallic mineral products, tourism, trade, financial, bank, and real estate investment trust sectors in the short run. Gökalp (2019) examines the causal relationship between the returns of the BIST-100 index and the consumer confidence index for December 2002-December 2018 timespan by using the diagonal VECH model, and proves that the consumer confidence index positively and significantly affects the stock market returns in Turkey, whereas the causal relation from stock market returns to consumer confidence is not detected. On the contrary, Cagli (2019) offers findings that no Granger causality from consumer confidence to the BIST-100 index is detected for the entire period of 2004:01-2019:01, while Granger-causality from consumer confidence to stock prices exists for the sub-period of 2017:04-2018:09. All implies that the relationship between consumer confidence and stock prices can depend on the investigated time-period affected by the changes on the economic and political issues and/or operating environment.

DATA

This study investigates the influences of the fluctuations in exchange rates, and oil prices, and the consumer confidence index on the returns of the composite index of manufacturing firms' stock prices in BIST (XUSIN) for March 2020-September 2022 by using monthly data. [†]The exchange rate (EXC) variable is the

[†] The BIST data is obtained from Yahoo. Finance database.

monthly returns of the rate on the US dollar / Turkish lira. As for oil (OIL), the monthly returns of European Brent oil prices are utilized. Both variables are derived from the electronic database of the CBRT[‡]. The consumer confidence index (CCI) on a monthly basis is also obtained from the data source of the CBRT. To detect the integration orders of variables, augmented Dickey-Fuller (ADF) (1979) unit root test is utilized. Additionally, Phillips-Perron (1988) unit root test is also applied. According to test results, the variables of XUSIN, EXC, and OIL are detected as stationary at level (I (0)). However, the level of CCI is found as stationary in the first-differenced order (I (1)).

METHODOLOGY AND EMPIRICAL RESULTS

According to Pesaran et al. (2001), the ARDL model enables to construct the short-run and long-run dynamic relations among the variables when they are integrated with different orders. By following the steps in Pesaran and Pesaran (2009), and Sari et al. (2013), the cointegration existence among the variables (XUSIN-dependent variable, and the forcing variables - EXC, CCI, and OIL), and the long-run relationships are tested with the procedures of the bounds-testing approach as in Eq.1[§]:

$$\Delta \mathrm{XUSIN}_t = a_0 + \sum_{i=1}^{k} b_i \, \Delta \mathrm{XUSIN}_{t-i} + \sum_{i=0}^{k} c_i \, \Delta \mathrm{EXC}_{t-i} + \sum_{i=0}^{k} d_i \, \Delta \mathrm{CCI}_{t-i} + \sum_{i=0}^{k} e_i \, \Delta \mathrm{OIL}_{t-i} + \varphi_1 \mathrm{XUSIN}_{t-1} + \varphi_2 \mathrm{CCI}_{t-1} + \varphi_3 \mathrm{EXC}_{t-1} + \varphi_4 \mathrm{OIL}_{t-1} + u_{1t} \quad \textbf{(1)}$$

In the given model, the optimal lag lengths of ARDL (m, n, p, r) are determined by the Akaike Information Criteria (AIC). According to the given criteria, the optimal lag lengths are determined as ARDL (1, 4, 0, 2). The parameters of φ_i's are long-run coefficients. The null hypothesis H_0: $\varphi_1=\varphi_2=\varphi_3=\varphi_4=0$ (no cointegration among the variables) is tested with the comparison of the F-statistic with the critical values to detect the existence of cointegration. The F-statistic for the model is 18.4324 which exceeds all the critical values of I (0) and I (1)[**], indicating the existence of cointegration among the given variables. Since it is detected that EXC, OIL, and CCI are long-run forcing variables of stock returns of manufacturing companies, the long-run and short-run dynamic relations of the ARDL (1, 4, 0, 2) model can be constructed. The test results of the long-run model are offered in Table 1:

[‡] The Central Bank of the Republic of Turkey.

[§] ARDL can also be used in the analysis of endogenous relationships. Yet, considering the content of this study, the results of the ARDL (1,4,0,2) model are offered where the dependent variable is XUSIN return series.

[**] The critical values are 4.614 and 5.966 for I (0) and I (1), respectively at even 1% significance level.

Table 1: The Long-run ARDL (1,4,0,2) Model of XUSIN

Independent Variables	Coefficient	Std. Error	P-values
EXC	0.216131	0.974400	0.8275
CCI	-0.105533	0.529462	0.8447
OIL	-1.404314	0.440965	0.0062*

Notes: *<0.01, **<0.05, and *** <0.10.

The long-run relationship results indicate that oil price is the only variable that significantly impacts manufacturing companies' stock returns. This impact is found negative, which means that rises in oil prices depress these companies' stock prices. This result can be anticipated since a surge in oil prices causes rises in production costs and decreases the firms' profitability and dividend payments that are the main determinants of stock prices as stated by Basher and Sadorsky (2006). The negative relationship between oil prices and stock returns are also provided in the studies of Miller and Ratti (2009), Nandha and Faff (2008), and Alhayki (2014). However, there exist no significant long-run impacts of exchange rates on manufacturing firms' stock prices for the post-Covid-19 period. This result is in the line with the results of Çakmur Yıldırtan and Salihoglu (2021). They find that the exchange rates have no significant impacts on the stock market returns of financial firms in BIST for the post-Covid-19 period. They assert that the stock market returns during the pandemic period are not significantly affected by exchange rates and they point out the existence of different variables explaining the variation in stock prices. In addition, there is no significant relationship found between consumer confidence and stock market returns of BIST manufacturing companies in the long-run for the pandemic period. This result is found as consistent with findings of Kale and Akkaya (2016). They also offer that consumer confidence showing the investor sentiment does not have explanatory power on the main stock market indices in BIST before the pandemic period.

The short-term impacts of the selected independent factors on the stock returns of industrial companies are also constructed under the error correction model (ECM) as in Eq.2:

$$\Delta \mathrm{XUSIN}_t = a_0 + a_1\, ECM(-1) + \sum_{i=1}^{m} b_i\, \Delta \mathrm{XUSIN}_{t-i} + \sum_{i=0}^{n} c_i\, \Delta \mathrm{EXC}_{t-i} + \sum_{i=0}^{p} d_i\, \Delta \mathrm{CCI}_{t-i} + \sum_{i=0}^{r} e_i\, \Delta \mathrm{OIL}_{t-i} + u_{2t} \quad \textbf{(2)}$$

Table 2 gives the error correction model's test results. The most significant result in the short-term dynamics is the significance of the error correction term (ECM). If the ECM term has a negative coefficient with a significant result, it points out that the cointegrated series attain long-run equilibrium after the disturbances

(Esen et al., 2012). As seen, the coefficient of ECM is found negative and significant. The system comes to equilibrium in the long-run after the shocks.

Table 2: The ECM Test Results of ARDL (1,4,0,2) Model of D(XUSIN))

Independent Variables	Coefficient	Std. Error	P-values
ECM(-1)	-1.026750	0.095030	0.0000*
D(EXC)	0.361459	0.283359	0.2215
D(EXC(-1))	0.091663	0.314602	0.7748
D(EXC(-2))	-0.536399	0.298753	0.0928***
D(EXC(-3))	-0.639700	0.254189	0.0237**
D(OIL)	-0.129628	0.185939	0.4964
D(OIL(-1))	1.035551	0.123436	0.0000*

Notes: * <0.01, ** < 0.05, and *** < 0.10.

The final procedure of the ARDL methodology application is performing diagnostic checking as given in Table 3. The ARDL (1, 4, 0, 2) model does not seem to have heteroskedastic variance according to the Breusch-Pagan-Godfrey heteroskedasticity test. Furthermore, Breusch-Godfrey Serial Correlation LM test does not imply the existence of serial autocorrelation problem for the selected model.

Table 3: Diagnostic Test Results of ARDL (1, 4, 0, 2) Model

	F-statistic	Prob.
Breusch-Pagan-GodfreyTest (Homoskedasticity Assumptions)	0.7449	0.6755
Breusch-Godfrey LM Test (No Serial Correlation Assumption)	0.2739	0.7646

It is also better to check the structural stability of the constructed ARDL (1, 4, 2, 0) model by implementing the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) tests (Sari et al., 2013) as in Figure 1 and Figure 2, respectively. Both lines in the plots remain in the critical bands, indicating that the model has stable coefficients over the given period, and no serious problem is detected.

Figure 1: The CUSUM Plot of ARDL (1,4,0,2) Model

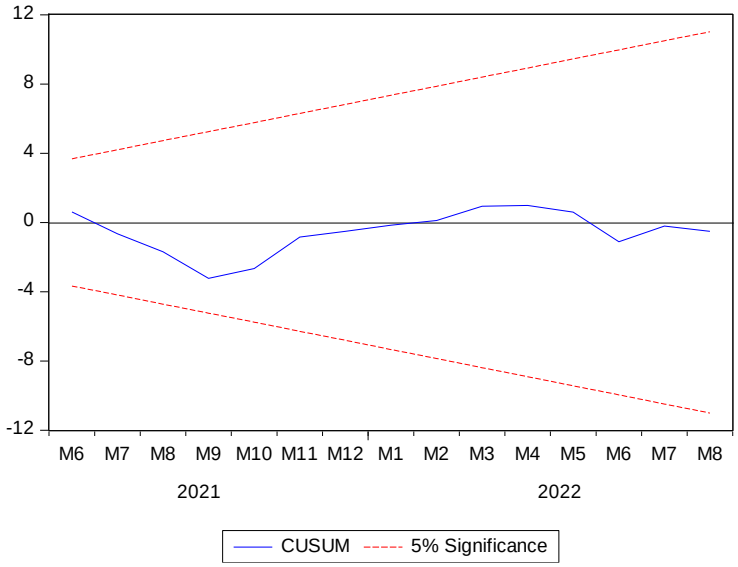
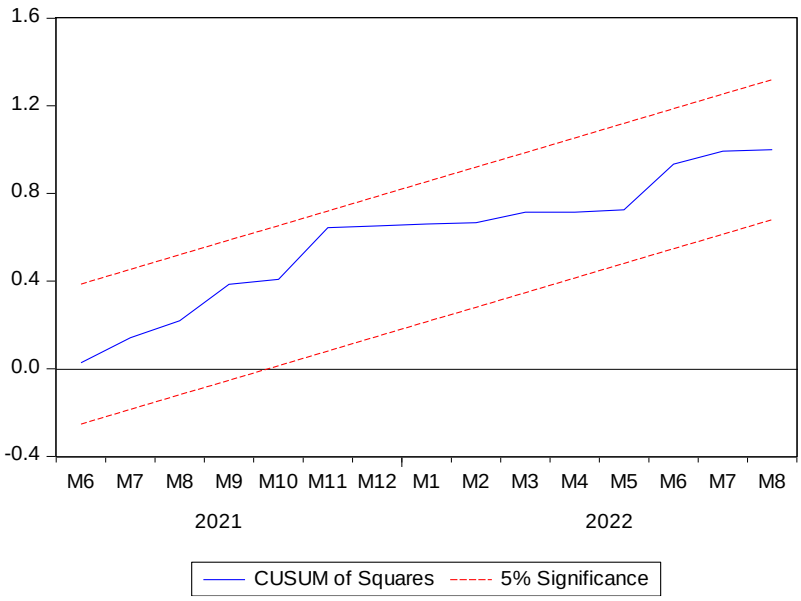


Figure 2: The CUSUMQ Plot of ARDL (1,4,0,2) Model



CONCLUSION

Regarding the severe and significant impacts of the recent global health crisis resulting from Covid-19 disease, this study investigates how the exchange rates, consumer confidence, and oil prices drive the stock prices of manufacturing companies traded in BIST during the Covid-19 period. The ARDL method of Pesaran et al. (2001) is implemented because this methodology does not need the same integration order of variables, and it is also effective when the sample size is small (Kamaruddin and Jusoff, 2009). The empirical test results imply that there exists cointegration among the dependent variable (XUSIN) and the selected independent variables (exchange rate, oil prices, and consumer confidence). The long-run test results show that the stock returns of the manufacturing companies in Turkiye are affected mainly by the changes in the oil prices during the Covid-19 period. Since Turkiye is an oil-importing country, and its manufacturing industry is considerably dependent on the oil, the dramatic changes in oil prices lead to high level of uncertainity for the manufacturing companies utilizing the oil as a signifincant input for production. In particularly, in a fragile environment such as financial crisis or pandemic times, the negative effects of the highly volatile oil prices are exacerbates on the stock market as suggested in the findings of the study. These empirical findings can be beneficial and informatory for corporate managers and authorties to take necessary precautions. At macro level, the dependence of manufacturing industry on oil as a energy source can be decreased via promoting and constructing new energy sites (such as renewable energy sources) by the authorities. At corporate level, the managers of the companies should engage in risk management tools including the forward, futures contracts in order to hedge commodity risk arising from the dramatic changes in oil prices. Thus, they can control and manage their costs, hence sustain their profitability, which in turn, prevents stock price declines. The results also imply that the changes in the exchange rate and the level of consumer confidence do not significantly affect the stock price returns of manufacturing companies in the long-run. Although the exchange rate and consumer confidence level do not seem to have noteworthy effects or explanatory power on the stock prices, the authorities should also take actions (such as ensuring resilience, stability, and confidence in the economy) to efface the fragilities and disturbances that resulting from any health or financial crisis, and to provide healthy financial markets.

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