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Economic uncertainty and working capital management: evidence from Turkey

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Abstract: The purpose of this paper is to examine the impact of economic uncertainty on the working capital management (WCM) of 96 Borsa Istanbul (BIST)-listed manufacturing firms from 2005Q1 to 2020Q4. A novel economic policy uncertainty (EPU) index for Turkey was used to measure economic uncertainty, and the cash conversion cycle (CCC) was used to measure WCM. Panel data were analysed, and the parameters of regression equations were estimated using fixed or random effects methods. The empirical results obtained indicate that EPU has a negative impact on working capital (WC) efficiency. Specifically, EPU has a significant and increasing impact on the CCC and its components, and the decrease in WC efficiency is demand related. To enhance WC efficiency, managers should maintain credit facilities, better manage the demand side, extend supplier payments, insure credits and reduce accumulated debts.

Keywords: working capital; economic policy; uncertainty; efficiency; Turkey; liquidity; panel data.

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1 Introduction

Companies should plan and monitor their cash flows to maintain their day-to-day operations. A company can survive for some time without realising profits or sales; however, it is difficult for a firm to survive even for a short period of time without enough cash in hand. Furthermore, firms should manage their operating cash to meet

demand for cash at minimum cost, as cash in hand can be invested in securities to gain return (Bensoussan et al., 2009).

Working capital (WC), consisting of receivables, payables, and inventory, are an important component of the overall operation of an enterprise (Cheng, 2019). Firms should plan and control their current assets and liabilities to meet short-term debt obligations while avoiding over-investment in short-term assets if they wish to effectively manage WC (Dbouk et al., 2020).

Working capital management (WCM) becomes more critical under economic uncertainty because unpredictability harms firm liquidity, which can lead to financial distress (Nugrahanti et al., 2020). Under economic uncertainty, demand for goods and services decreases, leading to a decrease in sales. In addition, firms temporarily pause their investment and hiring, resulting in a decline in productivity growth (Bloom, 2007). Economic uncertainty also increases the volatility of cash flows, leading to an increase in default risk. Cash management becomes more valuable in maintaining financial stability under such conditions because companies should determine which operations to carry on and which operations to postpone temporarily. As a result of events that cause economic uncertainty, such as the recent coronavirus disease (COVID-19) pandemic, many companies are struggling to maintain a sustainable cash flow.

The aim of this study was to examine the impact of economic uncertainty on the WCM. I have chosen Turkey as the main focus of this study because Turkey has a significant credit risk, as seen by the high CDS premium, making WCM management of firms more essential in a volatile business environment. Data for 96 Borsa Istanbul (BIST)-listed firms in the manufacturing sector over the period 2005Q1 to 2020Q4 were used. Panel data were analysed, and regression equation parameters were estimated using fixed and random effects estimators. The economic policy uncertainty (EPU) index for Turkey, developed by Topçu and Oran (2021), was used as a proxy for economic uncertainty, and the cash conversion cycle (CCC) was used as a proxy for WCM. The effects of economic uncertainty on the CCC and its components, namely, days sales outstanding (DSO), days sales of inventory (DIH) and days payable outstanding (DPO), were assessed. According to the findings of this study, EPU significantly increases the CCC and its components, which implies that EPU decreases WCM efficiency.

Most of the studies reported in the literature on economic uncertainty have investigated the impact of uncertainty on corporate investment decisions (Guiso and Parigi, 1999; Pindyck and Solimano, 1993; Bulan, 2005; Rosenberg, 2004; Ghosal and Loungani, 2000; Bell and Campa, 1997), although a few studies have examined the impact of uncertainty on the WCM of firms (Dbouk et al., 2020; Cheng, 2019; D'Mello and Toscano, 2020). Investigating the impact of economic uncertainty on the WCM of BIST-listed manufacturing firms is worthwhile because firms have reduced access to credit under economic uncertainty, which makes WC a key source of finance. This study's sample consisted of the largest firms in Turkey, the majority of which are exposed to various types of risks, making WCM a crucial matter for these firms under current macroeconomic picture. Furthermore, following the 2008 financial crisis, policy-makers began to question the overreliance of economic policies on boosted financial sector and shifted their focus to the manufacturing industries (Erekle et al., in press).

The remainder of this paper is organised as follows. Section 2 describes WCM, discusses economic uncertainty, reviews prior research on the impact of economic

uncertainty on WCM, and proposes hypotheses concerning the effects of economic uncertainty on WCM. Section 3 presents the methodology and data used. Section 4 presents the empirical results obtained, and Section 5 presents conclusions drawn from the results.

2 Literature review and hypothesis development

2.1 Working capital management

WC is composed of current assets and current liabilities and is the capital used by companies in their daily operations. Guthmann (1953, p.63) defines WC as "the portion of a firm's current assets which are financed from long-term funds." WC that is related to short-term financial decision-making and short-term financial management is often called WCM (Ross et al., 2010). The aim of managers working with WC is to manage the balance between current assets and current liabilities so that firms maximise their return on assets while minimising payments for liabilities. An effective WCM may have a positive impact on profitability of a company as the company has enough cash to run its operations smoothly while also being able to engage in additional activities that bring value to the company (Wichitsathian, 2019), and eventually, to the market value (Pestonji and Wichitsathian, 2019).

To measure WCM, I used the CCC, which is the metric most commonly used to evaluate the efficiency of cash flow management (Farris and Hutchison, 2002; Kroes and Manikas, 2014). Other terms used for the CCC include cash cycle time, cash cycle and cash gap (Uyar, 2009). The CCC is defined as "the number of days that pass before we collect the cash from a sale, measured from when we actually pay for the inventory" [Ross et al., (2010), p.582]. The CCC is a measure of the period of time over which a company converts its investments in inventory into cash. The formula for the CCC is as follows (Uyar, 2009):

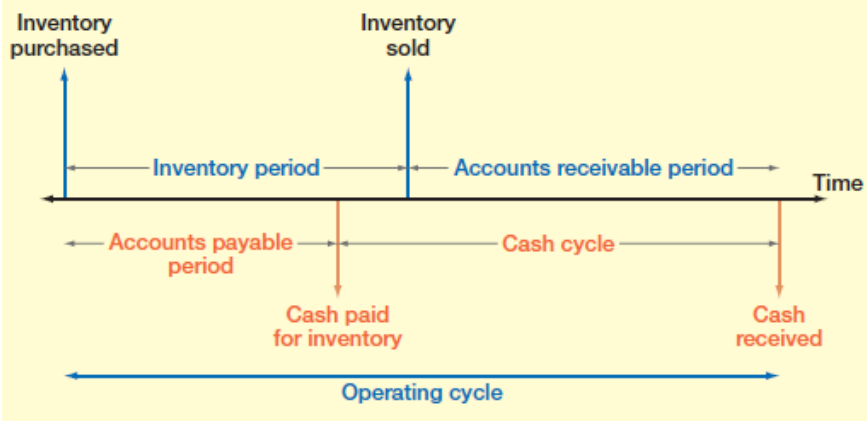
Cash conversion cycle = Days sale outstanding (DSO)

+Days sales of inventory (DIH) – Days payable outstanding (DPO)

The CCC is affected by either expansion or contraction in any of the following periods: the inventory period, the accounts receivable period, or the accounts payable period. Figure 1 shows a cash flow time line and the short-term operating activities of a typical manufacturing firm. As Figure 1 shows, the CCC corresponds to the difference between the operating cycle and the accounts payable period. The operating cycle is defined as "the sum of the average number of days necessary to purchase on credit and sell a product and the average number of days needed to collect sales" [Moss and Stine, (1993), p.25]. When payables are due before receivables, a liquidity problem exists. In extreme cases, a company may suspend payments, which may lead to financial distress for the company (Mongrut et al., 2014). The aim of the company should be to decrease the CCC period without adversely affecting the quality of its components.

Although there are other liquidity measures, such as the current ratio and the quick ratio, the CCC differs from these measures in terms of the time dimension or the flow concept of the CCC [Moss and Stine, (1993), p.25]. While measures such as the current ratio and the quick ratio focus on static balance sheet values, the CCC is a dynamic value that measures a firm's ability to pay its bills on time [Moss and Stine, (1993), p.25].

Figure 1 Cash flow time line and short-term operating activities of a typical manufacturing firm (see online version for colours)



Source: Ross et al. (2010, p.583)

2.2 Economic uncertainty and its impact on WCM

Uncertainty has an important impact on economic outcomes. Economic uncertainty affects economy through several channels. Ferrara et al. (2018) classified these channels into three types. The first channel is precautionary savings related to the consumption patterns of consumers. Under uncertainty consumers try to protect themselves by delaying consumption and saving more because they are not confident about their future incomes. The second channel is irreversible business investment. The degree of irreversibility of capital expenditures affects firms' decisions to invest because threshold return increases with uncertainty. The third channel is financial market frictions. When risk rises, financial intermediaries charge a higher premium to cover costs of a default to protect themselves from default risk. In addition to these three channels, economic uncertainty has an impact on economy through income inequality and welfare because households and individuals in different percentiles of income, wage, and consumption react differently to uncertainty shocks (Angeliki, 2018). Overall economic uncertainty has a negative impact on a country's economic situation, deterioration of which causes a greater demand for dollars for capital transfer out of the country (Onour and Sergi, 2021).

Uncertainty can be quantified using various approaches. Moore (2017, p.550) classified proxies used to measure uncertainty as newspaper-based measures of uncertainty, finance-based measures of uncertainty, and measures of disagreement among forecasters concerning key economic variables. Newspaper-based measures can be understood to include social media-related news as well. News-based measures calculate the frequency of predetermined keywords using related sources such as newspapers, Google, Twitter, etc., and then construct an index using these frequencies. A prominent example of news-based indices is the EPU index, developed by Baker et al. (2016). Finance-based measures of uncertainty use measures such as stock market volatility, the cross-sectional dispersion of firms' profits, volatilities in input prices and credit spreads (Chuliá et al., 2017). Measures of disagreement among forecasters concerning key economic variables include professional forecasters' forecast dispersions for key

macroeconomic variables, such as the gross domestic product (GDP), short-term and long-term inflation and unemployment rate.

Although there have been many studies on the impact of uncertainty on corporate cash holdings (Gao et al., 2017; Tran, 2021; Xu et al., 2016; Im et al., 2017; Hankins et al., 2019; Duong et al., 2020), studies on the impact of uncertainty on WCM are rare. Studies on the impact of uncertainty on corporate cash holdings have mostly found that companies reduce investments and increase cash holdings in uncertain times because of the increased value of the option of waiting and heightened financial constraints that exist under uncertainty. The impact of uncertainty on WCM complements the findings of these studies by taking into account the liability side, i.e., accounts payable whose management is as important as cash management.

Using a quarterly sample of 6,503 US manufacturing firms over the period from 1990 to 2018, Dbouk et al. (2020) investigated the impact of macroeconomic uncertainty on WC. They used a dynamic panel model and estimated regression equation parameters using the Arellano-Bover/Blundell-Bond generalised method of moments (GMM). They found that uncertainty has a significant impact on WC investment and its components and that the relationship between uncertainty and WC investment depends on a firm's business performance, business characteristics, and industry.

Cheng (2019) examined the impact of EPU on the efficiency of the corporate WCM of the 971 non-financial enterprises listed on the Shanghai and Shenzhen stock markets over the period 2000 to 2010. He used the CCC and its components as proxies for WCM efficiency and measured EPU using the Chinese EPU index. He detected a significant positive relationship between EPU and the CCC, implying that an increase in EPU makes WCM less efficient. He also discovered significant positive relationships between EPU and the components of WCM, namely receivables turnover days, inventory turnover days, and accounts payable turnover days, implying that an increase in EPU makes accounts receivable management and enterprise inventory management less efficient, while accounts payable management becomes more efficient.

Using data for non-financial US firms, D'Mello and Toscano (2020) investigated the impact of EPU on trade credit over the period from 1986 and 2016. They used the EPU index developed by Baker et al. (2016) as a proxy for EPU. To measure trade credit, they used accounts payable, accounts receivable and net credit ratios. They detected a significant negative relationship between EPU and trade credit. Specifically, they found that a one-standard-deviation increase in EPU caused a 1.8% decrease in the median firm's accounts payable and receivable ratios.

2.3 Hypothesis development

I analysed the impact of economic uncertainty on WCM. For this purpose, I examined the impact of EPU on the CCC and its components, namely DSO, DIH and DSO.

In uncertain times, many businesses cannot operate in a healthy manner because as the economic outlook worsens, industry-specific problems increase and risk tolerance decreases, both of which cause a decrease in firms' operation levels. For example, during the recent COVID-19 crisis, many companies around the world ceased their operations temporarily because of the highly contagious nature of the virus, and consumer demand decreased because of social distancing and stay-at-home orders. In some industries, such as aviation, manufacturing, and tourism, decreases in operation levels led to decreases in sales and revenues that created concerns about firms' abilities to meet their debt

obligations. A solution to this problem may be to provide short-term financial support in terms of trade credits, which ease trade without immediate payment, helping selling firms to maintain their sales growth and market share (Cheng, 2019). For a selling firm, a trade credit represents an investment and is classified as accounts receivable (Kabir and Zubair, 2015). Under economic uncertainty, banks tight their lending standards because of worsening economic conditions. Tightened lending standards result in a decrease in bank loans. As bank loans decrease, trade credit becomes a substitute for bank loans, and demand for trade credits, especially from financially constrained firms, increases. From the perspective of selling firms, accounts receivables increase with the demand for trade credits by buying firms.

Economic uncertainty affects the average number of days that receivables remain outstanding before they are collected. As the economic outlook worsens, this period is prolonged, and the efficiency of WCM decreases due to the difficulties faced by firms in repaying their debts. Based on these arguments, I formulated Hypothesis 1 as follows:

Hypothesis 1 EPU increases DSO.

Under uncertainty, firms cannot accurately forecast the actual demand level; thus, inventory functions as a buffer against uncertainties in demand. Firms increase inventory to prevent stock-outs and smooth production and sales. However, less financially constrained firms hold less inventory because of their ability to deal with demand shocks by holding more liquid assets or extending more net trade credit (Caglayan et al., 2012). On the other hand, to minimise the risk of unanticipated surplus caused by increased business cycle volatility, firms become more cautious about holding high levels of inventory (Kim and Chung, 1989).

The average number of days that a company holds its inventory before selling it may increase due to insufficient demand created by economic uncertainty or increasing inventory levels maintained to prevent stock-outs. As days inventory held increases, inventory-related costs, such as capital cost, insurance on warehouse and equipment costs, inventory risk costs, and storage costs, increase. This causes inefficiency in WCM and in operational effectiveness. Based on the arguments above, I formulated Hypothesis 2 as follows:

Hypothesis 2 EPU increases DIH.

Under economic uncertainty, as banks tighten lending standards, demand for trade credits increases, which increases accounts payable. In addition, because of insufficient demand and temporarily suspended production, firms have difficulties in making sales, meaning that cash on hand shrink over time. It is more logical for firms to make payments to suppliers later on and for a prolonged period if cash on hand is deficient. Hence, I formulated Hypothesis 3 as follows:

Hypothesis 3 EPU increases DPO.

Hypotheses 1 to 3 examine the impact of economic uncertainty on the components of the CCC. The overall impact of the CCC components is assessed using the variable CCC. A shorter CCC is preferable for firms as shorter CCC creates more cash flow and faster operations, allowing firms to focus on other revenue-generating activities [Wichitsathian and Pestonji, (2019), p.507]. A negative CCC is also possible. An optimal CCC occurs when a firm decreases DSO and DIH while increasing DPO. On the other hand, a

company should not experience inventory shortages, lose its good-credit customers, or harm its own credit reputation while it takes actions to reduce the CCC (Nobanee and Al Hajjar, 2014). Because economic uncertainty has a negative impact on business operations, it takes firms longer to turn their investments in resources into cash flows from sales under uncertainty. To examine the impact of economic uncertainty on the CCC, I formulated the following hypothesis:

Hypothesis 4 EPU increases the CCC.

3 Methodology and data

3.1 Econometric model and estimation technique

To examine the impact of economic uncertainty on WCM efficiency, I used the following panel data regression model:

$$VCM_{i,t} = \alpha_i + \gamma EPU_t + \sum_{k=1}^{4} \delta_k FSC_{i,t} + \sum_{k=1}^{3} \theta_k MEC_{i,t} + QRT_t + \varepsilon_{i,t} \quad (1)$$

In this equation, the subscript i denotes individual firms, and the subscript t denotes the time period. $VCM_{i,t}$ measures four WCM variables, namely DSO, DIH, DPO and CCC. I developed four separate regression equations for each WCM variable. EPU_t is the independent variable that measures EPU. $FSC_{i,t}$ is the vector of firm-specific control variables and captures four dimensions: leverage, sales growth, cash flow and profitability. $MEC_{i,t}$ is the vector of macroeconomic control variables and captures three dimensions: GDP growth, exchange rate and interest rate. $\varepsilon_{i,t}$ represents identically and independently distributed errors.

There are two main types of estimators in the literature for regression estimation: fixed effects and random effects. I applied the Hausman specification test to select the appropriate estimation method, where rejection of the null hypothesis implies that the preferred model is a fixed effects model. The null hypothesis of the Hausman test was rejected at the 1% significance level when DSO, DIH, and CCC were the dependent variables, implying that a fixed effects model is appropriate for estimating the parameters of those equations. When DPO was the dependent variable, however, the null hypothesis was not rejected, indicating that a random effects model is best suited to estimating the parameters of the equation.

The next step was to assess whether the model passed diagnostic tests such as those for cross-sectional dependency, heteroskedasticity and autocorrelation.[1] I used the Pesaran cross-sectional dependence (CD) test to assess the presence of cross-sectional dependency, the modified Wald test to assess the presence of heteroskedasticity, and the Wooldridge test to assess the presence of autocorrelation. The null hypothesis of the Pesaran CD test result was rejected at the 1% significance level for all equations, demonstrating the presence of cross-sectional dependency in the data. The modified Wald test and the Wooldridge test results prove the existence of heteroskedasticity and first-order correlation in the data. Table 1 reports the diagnostic tests results, along with the Hausman test results. Because the panel data have heteroskedasticity, serial correlation, and CD, I used Driscoll-Kraay (1998) standard errors that are robust to heteroskedasticity, autocorrelation, and general forms of CD.

Table 1 Hausman specification, Pesaran CD, modified Wald and Wooldridge test results

	DSO	*DIH*	*DPO*	*CCC*
Hausman specification test statistic	14.64**	57.70***	8.65	64.80***
Pesaran CD-test statistic	13.024***	72.170***	14.450***	24.201***
Modified Wald test statistic	2.2e+05***	7.5e+05***	1.70E+05	3.3e+05***
Wooldridge test statistic	7.557***	13.575***	7.557***	17.872***

Notes: *, ** and *** denote significance levels at 10%, 5% and 1%, respectively. The results of the Hausman specification test and the modified Wald test are based on a $\chi 2$ distribution, the Wooldridge test is based on an F distribution, and the Pesaran test is based on the standard normal distribution.

3.2 Variables

3.2.1 Dependent variable

Four WCM variables, namely, DSO, DIH, DPO, and CCC, were used as dependent variables. The importance of effective liquidity management in a volatile business environment such as Turkey is one of the reasons for choosing WCM issue as dependent variable. Furthermore, financial ratios are valuable indicators of a firm's financial performance in the past, present and future [Steja and Gunardi, (2017), p.252]. Table 2 lists the variables used in this study and their corresponding measures.

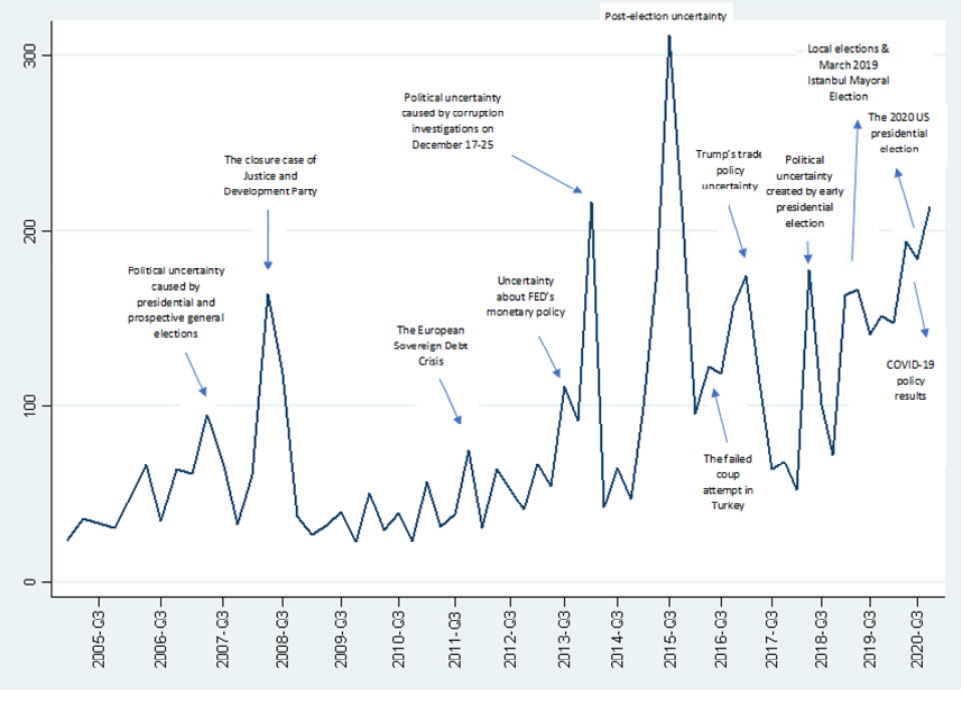
Table 2 Main variable descriptions

Variable	*Notation*	*Measures*
Dependent variables		
Days sales outstanding	DSO	(Accounts receivables / sales) × 365 / 4
Days sales of inventory	DIH	(Inventory / cost of goods sold) × 365 / 4
Days payable outstanding	DPO	(Accounts payable / cost of goods sold) × 365 / 4
Cash conversion cycle	CCC	Days sales outstanding + days sales of inventory – days payable outstanding
Independent variable		
Economic uncertainty	EPU	Quarterly geometric average of Turkey's monthly EPU index
Firm-specific control variables		
Leverage	LEV	Total liabilities / total assets
Sales growth	SG	(Sales for the current quarter – sales for the previous quarter) / sales for the previous quarter
Cash flow	CF	EBITDA / sales
Profitability	ROA	Net income / total assets
Macroeconomic control variables		
GDP growth rate	GDP	Quarterly GDP growth in percentage
Exchange rate	ER	Real effective exchange rate based on the consumer price index (CPI), with 2003 as the base year
Interest rate	IR	Discount rate for Turkey in percentage

3.2.2 Independent variable

I used EPU as the independent variable and proxied EPU with the news-based EPU index for Turkey, developed by Topçu and Oran (2021). The index was constructed using the method developed by Baker et al. (2016). However, because the financial dataset in this study is on a quarterly basis, I turned this monthly index into a quarterly index using geometric average. Figure 2 depicts the main spikes in Turkey's EPU index. As Figure 2 shows, the level of uncertainty has increased in recent years. The EPU index for Turkey rises primarily with local events and in particular with national elections, local elections, national political uncertainties, central bank-related uncertainties, US presidential elections and the recent COVID-19 pandemic.

Figure 2 EPU index for Turkey (2005Q1–2020Q4)* (see online version for colours)



Notes: EPU index for Turkey was prepared monthly for the period from 2000 to 2018 in Topçu and Oran (2021). However, in this paper, a quarterly version of this monthly EPU index with a different time period is employed.

Source: Reproduced from Topçu and Oran (2021), copyright 2021 by Inderscience Publishers, reproduced with permission

Other economic uncertainty measures in the literature include standard deviation of daily stock returns (Xu et al., 2010), volatility in exchange rates, input prices, and product demand (Bell and Campa, 1997), term premium embedded in the term structure of interest rates (Ferderer, 1993), country risk (Demir, 2009), and the standard deviation of annual percentage changes in the marginal profitability of capital (Pindyck and Solimano, 1993). Instead of using these uncertainty measures, I used a newspaper text search-based EPU index since this index can produce useful proxies for economic and policy

conditions spanning several decades [Baker at al., (2016), p.1598] and is high frequency (Luk et al., 2018). Other measures, such as stock price volatility measured by standard deviation, are a crude assessment of investors' perceptions of capital risk [Pindyck, (1986), p.17] and may not account for changing perceptions of uncertainty due to possible future events (Ferderer, 1993).

3.2.3 Control variables

To avoid a model misspecification problem, I used firm-specific and macroeconomic control variables that may affect the relationship between WCM and economic uncertainty. Firm-specific control variables are leverage, sales growth, cash flow and profitability. I used earnings before interest, taxes, depreciation, and amortisation (EBITDA) divided by sales as a proxy for cash flow. Earnings might have been used as an alternative proxy to measure cash flow as the proportion of its components, i.e., accruals, and operating cash flow, affect the quality of earnings (Rudiawarni et al., 2017), which is essential for firm's value. The value relevance of earnings (Turel, 2009) and financial reporting quality in Turkey (Balsari et al., 2010) has increased significantly with the adoption of IFRS in Turkey. Following examples from the literature, I used the GDP growth rate, exchange rate and interest rate as macroeconomic variables to measure the impact of economic uncertainty on WCM more clearly. The exchange rate plays an important role in WCM, as most Turkish companies buy raw materials from abroad. Currency fluctuations influence the quantities of raw materials purchased.

3.3 Sample

I used as the sample data the quarterly financial statements of 96 manufacturing firms listed on BIST, because they regularly practice trade credit, inventory and WCM [Dbouk et al., (2020), p.6] compared to non-manufacturing firms. The data were balanced panel data, and the data period was from 2005Q1 to 2020Q4. All data are on a quarterly basis. The number of firm observations in the dataset was 6,144. I obtained the firm-level data from Finnet, which has an online platform that supplies financial data.[2] I obtained macroeconomic data, i.e., exchange rates and GDP data, from the Central Bank of Turkey's Electronic Data Delivery System, and I obtained interest rate data from the webpage of the US Federal Reserve Bank of St. Louis.

4 Empirical results

4.1 Descriptive statistics

Table 3 summarises the descriptive statistics for the variables over the period 2005Q1 to 2020Q4. Some companies have high DSO, DIH, and DPO levels, indicating that their WC levels are not optimal. The mean of the CCC was 123.241, indicating that on average it takes a company 123.241 days to convert its investments in inventory into cash flows from sales. The minimum CCC was –313.698, which shows that some companies need less time to sell inventory and collect cash than they do to pay their suppliers. For all dependent variables, the mean value was higher than the median value.

Table 3 Descriptive statistics

Variable	*Observations*	*Mean*	*Median*	*Standard deviation*	*Min.*	*Max.*
Dependent variables						
DSO	6,144	90.605	76.791	70.933	0.013	1,183.40
DIH	6,144	105.425	80.648	136.142	2.191	4,524.03
DPO	6,144	72.789	60.045	62.867	1.693	2,493.57
CCC	6,144	123.241	97.84	145.002	–313.7	3,313.23
Independent variable						
EPU	6,144	90.907	65.999	62.589	22.942	310.851
Firm-specific control variables						
LEV	6,144	0.503	0.488	0.241	0.024	3.427
SG	6,144	0.115	0.026	0.722	–0.985	20.027
CF	6,144	0.096	0.102	0.211	–9.352	1.845
ROA	6,144	0.01	0.01	0.073	–2.927	4.055
Macroeconomic control variables						
GDP	6,144	1.267	1.55	3.096	–11	15.9
ER	6,144	101.437	105.135	16.662	62.18	127.71
IR	6,144	16.288	15	6.671	8.75	32

Turkey's EPU index had a mean value of 90.907, a standard deviation of 62.589, and a range of 22.942 to 310.815. These values show that EPU was high during the study period. The mean of the leverage variable was 0.503, indicating that, on average, firms in the sample were not in a high financial risk category. However, the maximum value of leverage was 3.427, indicating that some firms had more liabilities than assets, potentially leading to financial distress and bankruptcy in the near future. SG, CF, and ROA had negative values, indicating that some companies' sales and cash flows may have been negatively affected by economic uncertainty. The mean CPI-based real effective exchange rate was 101.437, and its range was from 62.18 to 127.71, which means that the Turkish lira was greatly undervalued against other currencies during some periods and slightly overvalued during others.

4.2 Regression results

Table 4 reports the coefficients of the regression variables and basic tests estimated using fixed effects and random effects models, with the Hausman specification test as the selection criterion. According to the results of the Hausman specification test, the fixed effects model is appropriate when the dependent variables are DSO, DIH, and CCC, whereas the random effects model is appropriate when the dependent variable is DPO. The Wald and F tests results show that the explanatory variables in the models are jointly significant. Taken together, the findings indicate that there is strong empirical support for the idea that EPU decreases WCM efficiency, since EPU is positive and significant at 1% level when CCC, DSO, and DIH are dependent variables, respectively. Regression results also support all hypotheses from 1 to 4.

Table 4 Regression estimation results

Estimation method	*Fixed effects*	*Fixed effects*	*Random effects*	*Fixed effects*
Independent and control variables	*Dependent variables*			
	DSO	*DIH*	*DPO*	*CCC*
EPU	0.306***	0.532***	0.222***	0.595***
	(0.015)	(0.033)	(0.014)	(0.039)
LEV	–15.554**	–41.307***	62.010***	–117.727***
	(7.376)	(13.908)	(8.423)	(18.390)
SG	–10.515***	–26.923***	–7.552***	–29.808***
	(1.337)	(4.931)	(1.507)	(4.384)
CF	–77.257***	–79.750**	–25.810**	–131.638***
	(11.851)	(38.624)	(10.043)	(38.869)
ROA	–10.027*	–11.158	–21.676	–0.557
	(5.788)	(20.559)	(13.202)	(28.051)
GDP	–0.452***	–0.602***	–1.136***	–0.077
	(0.044)	(0.155)	(0.048)	(0.143)
ER	0.571***	0.352***	–0.011	0.827***
	(0.013)	(0.024)	(0.010)	(0.032)
IR	–0.815***	0.503***	1.396***	–0.357***
	(0.023)	(0.078)	(0.081)	(0.073)
Number of observations	6,144	6,144	6,144	6,144
R-squared	0.1724	0.0818	0.1619	0.1635
F-statistics	45.98***	19.51***	-	29.75***
Wald chi^2	-	-	1918.65***	-
Quarter dummies	Yes	Yes	Yes	Yes
Seasonal dummies	Yes	Yes	Yes	Yes

Notes: The numbers in parentheses are the standard errors.
*, ** and *** denote significance levels at 10%, 5% and 1%, respectively.

According to the results shown in Table 4, column 1, the relationship between DSO and EPU is positive and significant at the 1% level. As the economic outlook worsens, credit sales as a proportion of total sales increases, and firms have difficulties in repaying their debts on time. Delays in receivables, in turn, increase DSO and decrease the efficiency of receivables management. The coefficients of the firm-specific control variables, i.e., LEV, SG, CF, and ROA, are all significantly negative, indicating that profitable enterprises with good cash flow in production and operation and less financial distress can gain significant bargaining power based on market position [Cheng, (2019), p.824]. The coefficients of GDP, ER, and IR are all significant at the 1% level, indicating that the collection of account receivables is influenced by the macroeconomic environment. When GDP shrinks, companies have difficulties in collecting receivables because firm insolvency rises, causing the collection period to lengthen. Because Turkey is undergoing import substitution industrialisation as a result of its cost advantage, a decrease in real effective exchange rates, i.e., a depreciation of the Turkish lira, may increase costs,

resulting in increased prices. Accordingly, demand for goods decreases, and capacities cannot be fully utilised. As sales decline, so do companies' revenues, and they become less competitive in the market. As a result, receivables may not be collected on time.

According to the results shown in Table 4, column 2, the impact of EPU on DIH is positive and significant at the 1% level. This means that when EPU increases by one point, the average number of days a company holds its inventory before selling it is expected to increase by 0.532 days, ceteris paribus. Economic uncertainty is relevant to inventory management because firms cannot fully control sales or inventory due to uncertainty in supply. The impact of SG on DIH is negative and significant at the 1% level, indicating that inventory may accumulate in warehouses because of decreased sales.

The results shown in column 3 of Table 4 indicate that the impact of EPU on DPO is positive and significant at the 1% level. As economic uncertainty increases, demand for goods decreases, and production may be suspended. In these circumstances, it will be difficult for firms to make sales, leading to cash shortages over time. Therefore, firms delay their payments as much as possible, which prolongs the payment period. The coefficient of SG is significant and negative, which also supports the prolonged payment period.[3]

According to the results shown in Table 4, column 4, the CCC increases with EPU. This is not a surprising finding because it confirms the findings of this study that the relationships between EPU and the CCC components are in the expected direction: as economic uncertainty increases, it takes longer to convert inventory into cash in hand, reducing WCM efficiency. Furthermore, the SG coefficient is negative and significant at the 1% level, indicating that WCM inefficiency is related to demand. The coefficients of LEV, CF, ER, and IR are all significant at the 1% level. As leverage or cash flow increases, firms should pay greater attention to WCM efficiency to prevent overinvestment in accounts receivable and inventories. The results also confirm the negative relationship between exchange rates and WCM efficiency when DSO is used as the dependent variable.

4.3 Robustness checks

I checked the robustness of the results, first using alternative measurements of the CCC components and then using an alternative model and method to estimate regression equation parameters.

4.3.1 Alternative measurements of WCM efficiency

Instead of using DSO, DIH, and DPO as dependent variables, I used AR (accounts receivable / total assets), INV (inventories / total assets), and AP (accounts payable / total assets) to measure the impact of EPU on WCM efficiency. I ran the same diagnostic tests as before and the Hausman specification test on the data. Based on the results, I estimated the equation parameter values using fixed or random effects and Driscoll-Kraay (1998) standard errors. Table 5 shows that the negative relationship between EPU and WCM efficiency is robust to the use of alternative measurements of WCM efficiency.

Table 5 Regression estimation results

Estimation method	*Random effects*	*Random effects*	*Fixed effects*
Independent and control variables	*Dependent variables*		
	AR	*INV*	*AP*
EPU	0.0004***	0.0004***	0.0002***
	(0.0000)	(0.0000)	(0.0000)
LEV	0.028	0.0018	0.1063***
	(0.0181)	(0.0087)	(0.0123)
SG	0.0078***	–0.0023	0.0031***
	(0.0022)	(0.0018)	(0.0008)
CF	0.0202*	–0.0226***	–0.0179***
	(0.0114)	(0.0047)	(0.0042)
ROA	0.0186	–0.0169***	–0.0294
	(0.0176)	(0.0052)	(0.0200)
GDP	0.0007***	0.0005***	0.0002***
	(0.0001)	(0.0000)	(0.0000)
ER	0.0015***	0.0015***	0.0007***
	(0.0000)	(0.0000)	(0.0000)
IR	–0.0009***	–0.0006***	–0.0008***
	(0.0001)	(0.0001)	(0.0000)
Number of observations	6,144	6,144	6,144
R-squared	0.0335	0.0147	0.2000
F-statistics	-	-	54.24***
Wald chi^2	767.27***	940.24***	-
Quarter dummies	Yes	Yes	Yes
Seasonal dummies	Yes	Yes	Yes

Notes: The numbers in parentheses are the standard errors.
*, ** and *** denote significance levels at 10%, 5% and 1%, respectively.

4.3.2 Alternative estimation method

I also considered the dynamic version of the baseline model and included the lagged dependent variables as a regressor, with the dependent variables being DPO, DIH, DSO, and CCC. To remove endogeneity concerns, I estimated the model with the two-step system GMM method proposed by Blundell and Bond (1998). The system GMM method has the following advantages over the difference GMM method [Piper, (2014), pp.7–8]:

1 system GMM enables more instruments and increases efficiency [Roodman, (2009), p.86]

2 difference GMM magnifies gaps in unbalanced panels [Roodman, (2009), p.104]

3 unlike difference GMM, system GMM does not eliminate the fixed effects [Roodman, (2009), p.104].

Table 6 reports the two-step system GMM results.

Table 6 Two-step system GMM estimation results

Independent variables	*Dependent variables*			
	DSO	*DIH*	*DPO*	*CCC*
DSO Lag1	0.206			
	(0.165)			
DIH Lag1		0.331***		
		(0.048)		
DPO Lag1			0.0294*	
			(0.161)	
DPO Lag2			–0.066*	
			(0.035)	
CCC Lag1				0.473***
				(0.073)
EPU	0.039***	0.025	0.026**	0.057***
	(0.012)	(0.023)	(0.013)	(0.014)
LEV	–71.772	–117.857	17.641	–196.627***
	(43.720	(71.729)	(42.582)	(71.133)
SG	–16.922**	–43.637***	–11.271**	–54.189***
	(6.884)	(9.621)	(5.405)	(10.834)
CF	–54.229***	–40.225	–5.488	–105.134**
	(16.177)	(54.695)	(7.174)	(47.069)
ROA	–36.005***	–5.256	–13.473	–22.110
	(9.279)	(19.600)	(8.951)	(16.536)
GDP	–0.898***	–1.087	–0.594*	–1.001
	(0.264)	(1.108)	(0.327)	(0.694)
ER	–1.087***	–0.577	–0.708***	–0.911**
	(0.253)	(0.540)	(0.265)	(0.458)
IR	–2.050***	–0.54	–1.089***	–1.176*
	(0.543)	(0.762)	(0.398)	(0.659)
Constant	969.495***	307.4	405.154*	721.833*
	(219.836)	(460.114)	(213.647)	(384.219)
Wald chi^2	390.75***	328.03***	310.18***	367.36***
Number of observations	6048	6048	5952	6048
Number of instruments	13	13	15	13
AR(1)	–2.46**	–2.23**	–1.74*	–2.66***
AR(2)	0.53	0.35	0.34	0.31
Hansen test	1.73	2.41	4.07	6.68

Notes: The numbers in parentheses are the standard errors.
*, ** and *** denote significance levels at 10%, 5% and 1%, respectively.

The instrumental variables used in the study should satisfy the relevance condition as well as the exogeneity condition. The results of the autocorrelation and Hansen's tests indicate that the model passes the specification tests. The regression results indicate that

the impact of EPU on DSO and CCC are significant and positive at the 1% significance level, confirming the finding that economic uncertainty decreases WCM efficiency. Companies operating in Turkey, particularly production-oriented firms, require an effective WCM under economic uncertainty due to unpredictable currency rates, growing inflation linked to interest rates and import substitution industrialisation.

5 Conclusions

Volatile exchange rates, trade wars, political uncertainties such as elections, and the possibility of recessions all increase economic uncertainty in the environment in which firms operate. WCM is becoming more important in today's macroeconomic environment, in which firms need to maximise the efficiency and effectiveness of their WC processes. WC optimisation reduces a firm's WC financing requirements while increasing the firm's income and wealth (Lamichhane, 2019).

The purpose of this study was to examine the impact of economic uncertainty on the WCM of BIST-listed firms over the period from 2005Q1 to 2020Q4. For this purpose, I used the quarterly financial statements of 96 firms as the sample and the EPU index for Turkey as the uncertainty measure. I used panel data analysis, ran four separate regressions with DSO, DIH, DPO, and CCC as independent variables, and estimated the parameters of regression equations for fixed and random effects. Overall, I found that economic uncertainty has a negative impact on WCM. In particular, EPU has significant and positive impacts on DSO, DIH, DPO and CCC. Furthermore, SG has significant and negative impacts on all of the CCC components, as well as on the CCC. As conditions become worse in an economic environment, firms may suspend production, be unable to collect receivables, and fail to make payments on time, reducing WCM efficiency and thus experiencing decreased liquidity. When economic environment conditions deteriorate, demand for goods falls and, along with suspended production, sales growth decreases. We may deduce from the empirical findings of this study that WCM inefficiency is related to demand.

Economic uncertainties are more likely to occur in developing countries such as Turkey than in developed countries because of the high risks that these countries face. Manufacturing firms should manage their WC by taking into account the impact of economic uncertainty on their operational activities. To mitigate the effects of EPU on WCM, firms may opt to hold adequate amounts of liquid assets, maintain credit facilities, extend supplier payments, manage the demand side better, free themselves from accumulated debt, and avoid entering into long-term contracts.

A frequently used check type employed by Turkish firms is the 'postdated check', which can be cashed before the date specified on it. Due to the decrease of domestic demand during economic uncertainty, there may be delays in the payment of postdated checks. These delays may result in:

1 firm insolvency

2 a halt in trade

3 a damage in banking system (Güngör, 2008).

Future research may also include the impact of economic uncertainty on companies' postdated check payment behaviour.

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References

Angeliki, T. (2018) *The Impact of Macroeconomic Uncertainty on Inequality: An Empirical Study for the UK*, Munich Personal RePEc Archive (MPRA), No. 90448.

Baker, S.R., Bloom, N. and Davis, S.J. (2016) 'Measuring economic policy uncertainty', *The Quarterly Journal of Economics*, Vol. 131, No. 4, pp.1593–1636.

Balsari, C.K., Ozkan, S. and Durak, M.G. (2010) 'Earnings conservatism in the pre- and post-IFRS adoption periods in Turkey: panel data evidence on the firm specific factors', *Journal of Accounting and Management Information Systems*, Vol. 9, No. 3, pp.403–421.

Bell, G.K. and Campa, J.M. (1997) 'Irreversible investments and volatile markets: a study of the chemical processing industry', *The Review of Economics and Statistics*, Vol. 79, No. 1, pp.79–87.

Bensoussan, A., Chutani, A. and Sethi, S. (2009) 'Optimal cash management under uncertainty', *Operations Research Letters*, Vol. 37, No. 6, pp.425–429.

Bloom, N. (2007) *The Impact of Uncertainty Shocks*, National Bureau of Economic Research Working Paper, No. 13385, Cambridge.

Blundell, R. and Bond, S. (1998) 'Initial conditions and moment restrictions in dynamic panel data models', *Journal of Econometrics*, Vol. 87, No. 1, pp.115–143.

Bulan, L.T. (2005) 'Real options, irreversible investment and firm uncertainty: new evidence from U.S. firms', *Review of Financial Economics*, Vol. 14, Nos. 3–4, pp.255–279.

Caglayan, M., Maioli, S. and Mateut, S. (2012) 'Inventories, sales uncertainty and financial strength', *Journal of Banking & Finance*, Vol. 36, No. 9, pp.2512–2521.

Cheng, X. (2019) 'The impact of economic policy uncertainty on the efficiency of corporate working capital management – the evidence from China', *Modern Economy*, Vol. 10, No. 3, pp.811–827.

Chuliá, H., Guillen, M. and Uribe, J.M. (2017) 'Measuring uncertainty in the stock market', *International Review of Economics & Finance*, Vol. 48, No. C, pp.18–33.

D'Mello, R. and Toscano, F. (2020) 'Economic policy uncertainty and short-term financing: the case of trade credit', *Journal of Corporate Finance*, Vol. 64, No. C, pp.1–23.

Dbouk, W., Moussawi-Haidar, L. and Jaber, M.Y. (2020) 'The effect of economic uncertainty on inventory and working capital for manufacturing firms', *International Journal of Production Economics*, Vol. 230, No. C, pp.1–13.

Demir, F. (2009) 'Macroeconomic uncertainty and private investment in Argentina, Mexico and Turkey', *Applied Economics Letters*, Vol. 16, No. 6, pp.567–571.

Duong, H.N., Nguyen, J.H., Nguyen, M.Y. and Rhee, S.G. (2020) 'Navigating through economic policy uncertainty: the role of corporate cash holdings', *Journal of Corporate Finance*, Vol. 62, No. C, pp.1–22.

Erekle, P., Shugliashvili, T. and Machavariani, N. (in press) 'Economic policy of COVID-19: an emerging country perspective', *Int. J. Economic Policy in Emerging Economies*.

Farris, M.T. and Hutchison, P.D. (2002) 'Cash-to-cash: the new supply chain management metric', *International Journal of Physical Distribution and Logistics Management*, Vol. 32, Nos. 3/4, pp.288–298.

Ferderer, J. (1993) 'The impact of uncertainty on aggregate investment spending: an empirical analysis', *Journal of Money, Credit and Banking*, Vol. 25, No. 1, pp.30–48.

Ferrara, L, Lhuissier, S. and Tripier, F. (2018) 'Uncertainty and macroeconomics: transmission channels and policy implications', *Rue de la Banque, Banque de France*, April, No. 61.

Gao, J., Grinstein, Y. and Wang, W. (2017) 'Cash holdings, precautionary motives, and systematic uncertainty', *SSRN Electronic Journal*.

Ghosal, V. and Loungani, P. (2000) 'The differential impact of uncertainty on investment in small and large businesses', *The Review of Economics and Statistics*, Vol. 82, No. 2, pp.338–343.

Guiso, L. and Parigi, G. (1999) 'Investment and demand uncertainty', *The Quarterly Journal of Economics*, Vol. 114, No. 1, pp.185–227.

Gujarati, D.N. (2003) *Basic Econometrics*, 4th ed., The McGraw-Hill, USA.

Güngör, T. (2008) 'Vadeli Çek', *Dünya* [online] https://www.dunya.com/kose-yazisi/vadeli-cek/2720 (accessed 16 October 2021).

Guthmann. H. (1953) *Analysis of Financial Statements*, 4th ed., Prentice-Hall, New York.

Hankins, W., Stone, A., Cheng, C. and Chiu, C. (2019) 'Corporate decision making in the presence of political uncertainty: the case of corporate cash holdings', *Financial Review*, Vol. 55, No. 2, pp.307–337.

Im, H.J., Park, H. and Zhao, G. (2017) 'Uncertainty and the value of cash holdings', *Economics Letters*, Vol. 155, No. C, pp.43–48.

Kabir, M.R. and Zubair, S. (2015) 'Trade credit as an alternative to bank credit during the financial crisis', Paper presented at *European Conference of the Financial Management Association 2015*, Venice, Italy.

Kim, Y.H. and Chung, K.H. (1989) 'Inventory management under uncertainty: a financial theory for the transactions motive', *Managerial and Decision Economics*, Vol. 10, No. 4, pp.291–298.

Kroes, J.R. and Manikas, A.D. (2014) 'Cash flow management and manufacturing firm financial performance: a longitudinal perspective', *International Journal of Production Economics*, Vol. 148, pp.37–50.

Lamichhane, P. (2019) 'Efficiency of working capital management and profitability: evidence from manufacturing firms of Nepal', *Management Dynamics*, Vol. 22, No. 1, pp.21–34.

Luk, P., Cheng, M., Ng, P. and Wong, K. (2018) 'Economic policy uncertainty spillovers in small open economies: the case of Hong Kong', *Pacific Economic Review*, Vol. 25, No. 1, pp.21–46.

Mongrut, S., O'Shee, D.F., Zavaleta, C.C. and Zavaleta, J.C. (2014) 'Determinants of working capital management in Latin American companies', *Innovar*, Vol. 24, No. 51, pp.5–17.

Moore, A. (2017) 'Measuring economic uncertainty and its effects', *Economic Record*, Vol. 93, No. 303, pp.550–575.

Moss, J.D. and Stine, B. (1993) 'Cash conversion cycle and firm size: a study of retail firms', *Managerial Finance*, Vol. 19, No. 8, pp.25–34.

Nobanee, H. and Al Hajjar, M. (2014) 'Optimizing working capital management', *International Research Journal of Finance and Economics*, March, Vol. 120, pp.13–22.

Nugrahanti, Y.W., Sutrisno, T., Rahman, A.F. and Mardiati, E. (2020) 'Do firm characteristics, political connection and corporate governance mechanism affect financial distress? (Evidence from Indonesia)', *Int. J. Trade and Global Markets*, Vol. 13, No. 2, pp.220–250.

Onour, I.A. and Sergi, B.S. (2021) 'The impact of a political shock on foreign exchange markets in a small and open economy: a dynamic modelling approach', *Journal of Central Banking Theory and Practice*, Vol. 10, No. 3, pp.137–152.

Pestonji, C. and Wichitsathian, S. (2019) 'The impacts of working capital policy on firms' performances: an empirical study on Thai listed companies in production sector', *Asia-Pacific Contemporary Finance and Development (International Symposia in Economic Theory and Econometrics, Vol. 26)*, pp.39–51, Emerald Publishing Limited, Bingley.

Pindyck, R.S. (1986) *Risk Aversion and Determinants of Stock Market Behavior*, NBER Working Papers, No. 1921.

Pindyck, R.S. and Solimano, A. (1993) *Economic Instability and Aggregate Investment*, NBER Working Papers, No. 4380, National Bureau of Economic Research, Inc.

Piper, A.T. (2014) *The Benefits, Challenges and Insights of a Dynamic Panel Assessment of Life Satisfaction*, Munich Personal RePEc Archive (MPRA), No. 59556.

Roodman, D. (2009) 'How to do xtabond2: an introduction to difference and system GMM in Stata', *The Stata Journal*, Vol. 9, No. 1, pp.86–136.

Rosenberg, M.M. (2004) 'Firm risk, investment, and employment growth', *Journal of Economics and Finance*, Vol. 28, No. 2, pp.164–185.

Ross, S., Westerfield, R. and Jordan, B.D. (2010) *Fundamentals of Corporate Finance*, 9th ed., McGraw-Hill, Boston.

Rudiawarni, F.A., Sulistiawan, D. and Feliana, Y.K. (2017) 'When is earnings management really good news? Evidences from Indonesia', *Int. J. Trade and Global Markets*, Vol. 10, No. 1, pp.47–57.

Steja, J. and Gunardi, A. (2017) 'Predicting the financial distress of Indonesian manufacturing companies: an application of the multinomial logit model', *Int. J. Monetary Economics and Finance*, Vol. 10, Nos. 3–4, pp.250–256.

Topçu, G. and Oran, J. (2021) 'Measuring economic policy uncertainty in Turkey', *Int. J. Economic Policy in Emerging Economies*, Vol. 14, No. 3, pp.288–305.

Tran, Q.T. (2021) 'Economic policy uncertainty, value of cash and financial crisis', *European Journal of Management and Business Economics*, https://doi.org/10.1108/EJMBE-10-2020-0292.

Turel, A. (2009) 'The value relevance of IFRS: the case of Turkey', *Acta Universitatis Danubius. Œconomica*, Vol. 5, No. 1, pp.119–128.

Uyar, A. (2009) 'The relationship of cash conversion cycle with firm size and profitability: an empirical investigation in Turkey', *International Research Journal of Finance and Economics*, February, Vol. 24, pp.186–193.

Wichitsathian, S. (2019) 'Working capital management and its impacts on profitability: the case of small and medium food enterprises in Nakhon Ratchasima, Thailand', *Int. J. Economic Policy in Emerging Economies*, Vol. 12, No. 2, pp.113–120.

Wichitsathian, S. and Pestonji, C. (2019) 'Static and dynamic working capital management: the direct and indirect impacts on profitability and market value', *Int. J. Monetary Economics and Finance*, Vol. 12, No. 6, pp.498–510.

Xu, L., Wang, J. and Xin, Y. (2010) 'Government control, uncertainty, and investment decisions in China's listed companies', *China Journal of Accounting Research*, Vol. 3, No. 1, pp.131–157.

Xu, N., Chen, Q., Xu, Y. and Chan, K.C. (2016) 'Political uncertainty and cash holdings: evidence from China', *Journal of Corporate Finance*, Vol. 40, No. C, pp.276–295.

Notes

1 I also calculated the correlation coefficients between the explanatory variables. Gujarati (2003, p.359) states that multicollinearity is not a serious problem if the correlation coefficient between two variables is not above 0.80. None of the correlation coefficients were greater than 0.80, which indicates that multicollinearity is not a serious problem for the given variables.

2 Please note that when extracting data from Finnet, it is critical to distinguish between stock and flow variables.

3 Please note that while positive relationships between EPU and DSO and EPU and DIH are signs of WCM inefficiency, a positive relationship between EPU and DPO is a sign of WCM efficiency, which reduces the cash conversion period.