Insights from Corporate Cash Holdings in Emerging Markets

Guler Aras*[1] and Ozlem Kutlu Furtuna**[2]

Corporate savings has become a significant issue in contemporary international debates. Several studies have stressed the pros and cons of corporate cash holding in developed countries. As for the developing countries, the literature for the topic is scarce which contradicts to the significance of the topic due to the growing economic activities of Brazil, Russia, India and China (BRIC) and Turkey. This study proposes to highlight this issue for firms operating in BRIC countries and Turkey by determining corporate cash holding across different firm sizes and industries. The sample contains 5.840 firm-year observations across these countries for the period 2005–2014. Findings provide support for the notion that related firms is under financial constraint and propose to hold more cash within precautionary motive for cash management.

1. Introduction

Having an optimum level of corporate cash holding can reduce the probability of financial distress and reduce the increased costs of external funds. The trade-off theory and the pecking order theory, which are considered as modern approaches in capital structure decisions have provided new implications for managers in determining corporate cash holdings. Trade-off theory enables to explain how to determine the optimum level of cash in a firm and determines the linkage between cash and dividend payouts, investment opportunities, leverage level and cash flows. That theory states that the marginal benefit and marginal cost of debt has to be considered when holding too much cash.

The pecking order theory which is originated on the studies of Myers (1984) and Myers and Majluf (1984) reject the existence of an optimal level of corporate cash holdings. This argue that a hierarchical structure have to be pursued in financing of new investments. In the meantime, the first preference of firms to finance their investments is given to retained earnings, and then debt and finally at the end they prefer for equity share due to the new equities are highly costly to issue. Moreover, managers invest in cash to avoid financial difficulties and bankruptcy costs. However, excessive investment in cash leads to arise the conflict of interest of managers and shareholders. At this point, Jensen and Meckling's (1976) agency theory states that when investment opportunities are not enough and the corporation is financially constrained, firm may prefer holding cash in the company rather than distributing.

---

[1]Prof. Dr. Güler Aras, Corresponding Author, Yildiz Technical University, Business Administration Department, Center for Finance, Governance and Sustainability (CFGS), Davutpasa Campus, 34220, Istanbul, Turkey, e-mail: aras@yildiz.edu.tr
[2]Asst. Prof.Dr. Ozlem Kutlu Furtuna, Yildiz Technical University, Business Administration Department, Center for Finance, Governance and Sustainability (CFGS), Davutpasa Campus, 34220, Istanbul, Turkey, e-mail: ozzlemkutlu@yahoo.co.uk

BRIC countries are selected as the main group for their well-known driving role in the global economy. The four BRIC countries are distinguished from a host of other promising emerging markets by their demographic and economic potential to rank among the world's largest and most influential economies in the 21st century. Together, the four original BRIC countries comprise more than 2.8 billion people or 40 percent of the world's population, cover more than a quarter of the world's land area over three continents, and account for more than 25 percent of global GDP. Additionally the prediction reports (PWC, 2015) indicate that China and India will be the world's biggest economies in 2050, whereas Russia and Brazil will be in the top ten (5th and 8th).

This study aims to investigate the determinants that affect cash holding levels across different firm sizes and industries in firms' incorporated in BRIC countries and Turkey which are the main group for their well-known driving role in the global economy. Cash and cash equivalent is a significant policy matter in the field of modern corporate finance that is why this research work is intended to provide solution to the corporate managers regarding accessing cash and liquid assets requirement.

The remainder of the study is organized as follows. After the literature review, the following section presents sample and data collection. Industry effect on the corporate cash holding levels has been discussed in the fourth section. Fifth section states the differences of corporate cash holding across related countries with giving statistical insights from cash holding and net cash holding ratios. Finally, concluding remarks and areas for further research are revealed in the last section.

2. Literature Review

Among the trade-off, pecking order and agency theories, the motives of holding cash have to be clarified. The precautionary motive states that firms hold cash for the future uncertainity. Holding adequate cash makes firms good relationships with banks, high level of lending capacity, and profitability of investment opportunities. All these can reduce firms' precautionary motives of holding cash as well. When the payments and collections cannot be at the same time, firms have to hold optimal level of cash in order to meet their needs. Thus, the transaction motives underlying that cash holding can be used as a tool for lowering the transaction cost Baumol (1952). Finally speculative motive of holding cash can arise when the firm benefits from profitable investment opportunities, buy goods and services at a low price and make profit from price changes.

The literature for the topic is scarce which contradicts to the significance of the topic due to the growing economic activities of BRIC and Turkey. Firms in these countries have significantly increased their cash holdings over the recent years. For BRIC firms, Al-Najjar (2013) examines whether capital structure and dividend policy has an impact on corporate cash holdings in these countries and compare their results with US and the UK samples. For the period 2002 and 2008, he provides evidence that capital structure, dividend policy and firm size significantly affect corporate cash holdings. He also state firms in countries with low shareholder protection tend to hold more cash. Moreover, Amess et al. (2015) argue that China represents an attractive environment for investigating corporate cash holdings since government bodies retain a controlling ownership share in Chinese firms. Chen et al. (2012) investigate all nonfinancial firms listed on the Shanghai Stock Exchanges and reveal that the cash holding ratio significantly decrease in 2005 for the related firms. Moreover, Ameer (2014) investigate the investment ratios of 519 non-financial listed firms in six Asian countries (India, South Korea, Indonesia, Malaysia,

Pakistan and Thailand) between the years 1991 and 2004 and find significant differences which is explained in detail in the empirical findings of the study.

Another recent study, Hall et al. (2014) point out the determinants of cash holding at privately held and publicly held firms for 20 emerging between the years 2001 to 2010 and find that privately held emerging market firms have a propensity to increase cash levels than listed firms. Firms' cash balance has been seen in recent years as one of the main reasons for the conflict of interests between owners and managers, especially in developing countries. Seifert & Gönenç (2016) investigate the firms operating in 47 countries between the years 1996-2006 and state that the firms operating in countries where good corporate governance principles are applied and where regulations governing the fulfillment of the obligations exist has a tendency for holding less cash. Since corporate governance principles, namely transparency, fairness, responsibility and accountability make it easier for firms to raise funds from financial markets, this makes them to hold less cash.

For Turkish firms, Cetenak and Vural (2015) investigate investment-cash flow sensitivity of 164 BIST manufacturing firms during 2004 to 2014 and state that the firms which have more than % 15 foreign shareholders has an insignificant investment-cash flow relationship. Uyar and Kuzey (2014) analyze the factors that tend to explain the indicators corporate cash holdings of 389 Turkish-listed firms during the 1997 to 2011. Specifically, they investigate whether the growth opportunities affect cash holding levels of the related firms.

As far as previous literature review is concerned, there are a limited number of studies investigating the net cash holding and industry adjusted cash holding in BRIC and Turkey with giving the imputed cash methodology. This study aims to fill in a gap by focusing on these significant emerging markets and attempts to provide further insights on the corporate cash holding across different firm sizes and industries considering 5.840 firm-year observations across these countries for the period 2005–2014.

3. Sample and Data Collection

The sample of this study is gathered from the Bloomberg Professional Database for BRICs and Turkish firms with an observation period of ten years for the period 2005–2014. A sample composed of 670 nonfinancial firms with shares traded on the Brazil BOVESPA Stock Index for Brazil. 50 nonfinancial firms listed on the Eastern Europe MICEX Main Russian Index for Russia. A sample of 126 nonfinancial firms traded on the Bombay Stock Exchange for India. For China, 134 nonfinancial firms listed on the Shanghai Stock Exchange. Finally, in Turkey, 207 nonfinancial firms listed on Borsa Istanbul. Financial firms are eliminated since the statutory capital requirements and governmental regulatory requirements on their cash holdings differs. For alleviating the problems of outliers, all financial variables are winsorized at the 1st and the 99th percentile levels. As a result, the final sample includes 5840 yearly firm observations between 2005 and 2014 for 584 listed companies and Stata 11 software package used for the analyses.

3.1 Cash Holding versus Net Cash Holding

The first corporate cash holding proxy is selected to be *(CASH1)* as the corporate cash holdings ratio. This ratio is calculated as cash and cash equivalents account divided by the

total assets and used in several studies (Chen 2008; Borhanuddin and Ching 2011; Kusnadi 2011; Najjar 2013; Loncan and Calderia 2013; Ali 2013, Ali and Yousaf 2013; Anagnostopoulou 2013; Najjar 2013; Hall 2014; Uyar and Kuzey 2014; Ho et al. 2014).

Apart from this variable, Opler et al. (1999); Dittmar et al. (2003); Harford et al.(2006), Pinkowitz et al. (2006), Harford et al. (2008); Chen (2008); Lee and Lee (2009); Kusnadi (2011), Borhanuddin and Ching (2011); Kuan et al. (2011); Kuan et al. (2012); Gill and Shah (2012); Pinkowitz et al. (2013); Belkhir et al. (2014); Masood and Shad (2014); Chen et al. (2014) state that their empirical studies cash holding variable should be divided by net assets which is defined as total assets minus cash and cash equivalents, since cash does not generate profits. Following this argument, the second determinant of the cash holding *(CASH2)* is used as net cash holding variable for robustness testing.

Other proxies of cash holdings in literature has also given. The measurement of cash holding is expressed by log of cash by Kusnadi (2011) and Anagnostopoulou (2013). Earnings before interests, taxes, depreciation, deducting interests, taxes and dividends divided by total assets and expressed as free cash flow by Chen et al. (2009); Chen et al. (2015). Furthermore, cash flow sensitivity has also been studied by Almeida et al. (2004); Attig et al. (2013); Ameer (2014).

Finally, two variables are calculated to measure cash holdings in this study. First, direct measure of cash *(CASH1)* is calculated. Second, using the ratio of cash and cash equivalents over net assets, net cash holding variable *(CASH2)* is generated. Later, for highlighting the industry effect on determining cash holding, following the Subramanian et al. (2011) methodology, an industry-adjusted measure of the firm's cash to net sales ratio *(ADJCASH)* is created. Detailed information has been stated while discussing the industry effect on cash holding.

Table 1: Summary of Variables

Variable Name	Definition	Abbreviation
Cash Holdings	Cash / Total Assets	*CASH1*
Net Cash Holdings	Cash & Cash Equivalents / Net Assets	*CASH2*
Imputed Cash	$(Imputed\ Cash) = \sum_{n=1}^{n} \left(Asset_i * \frac{Cash}{Asset} \right) industry$	
Industry Adjusted Cash	(Cash−ImputedCash)/Asset	*ADJCASH*

4. Industry Affect

This study has investigated industry and sub-industry codes listed in Bloomberg Professional Database Industry Codes. They are listed as 5510 Utilities, 2520 Consumer Durables & Apparel, 2030 Transportation, 2550 Retailing, 1510 Materials, 2510 Automobiles & Component, 2020 Commercial & Professional Services, 3020 Food, Beverage & Tobacco, 4520 Technology Hardware & Equipment, 4510 Software & Services, 2540 Media, 3520 Pharmaceuticals, Biotechnology & Life Sciences, 200 Capital Goods, 5010 Telecommunication Services, 3030 Household & Personal Product, 2530 Consumer Services and 3510 Health Care Equipment & Services.

Each industry has its own characteristic as certain industries' earnings are highly volatile and are of high risk. This will affect the cash holdings decision indirectly.

Aras & Furtuna

This paper follows the similar methodology of Berger and Ofek (1995), Subramanian et al. (2011) and Brisker et al. (2013) to construct the third dependent variable—industry-adjusted cash holdings *(ADJCASH)*.

Table 1 above also gives the steps for determining this variable in detail.

For determining (ADJCASH); first, the median ratio of cash over total assets (CASH/TA) for each industry is calculated. Then, imputed cash holdings ImputedCash; as the product of the firms' industry median (CASH2) and its net asset value is defined. Lastly, adding up ImputedCash for each segment of a diversified firm gives us the firm-level ImputedCash. Third dependent variable of cash holdings then generated and it is the difference between the actual cash holdings of the firm and the ImputedCash, scaled by total assets of the firm. This variable is stated as ADJCASH (Cash−ImputedCash)/TA. Positive ADJCASH indicates that the firms hold more cash than the others and negative ADJCASH indicates that firms hold less cash compared with the others (Subramanian et al. 2011).

Table 2: Corporate Cash Holdings by Industry

Panel A: Bottom 5 Industries

	Industry description	Median	Mean	Std.Dev.
2520	Consumer Durables & Apparel	.0586	.1091	.1513
3020	Food, Beverage & Tobacco	.0706	.1331	.1746
5510	Utilities	.0894	.1034	.0766
1510	Materials	.0939	.1404	.1554
2030	Transportation	.0996	.1472	.1347

Panel B: Top 5 industries

	Industry description	Median	Mean	Std.Dev.
4510	Software & Services	.2314	.2971	.2501
4520	Technology Hardware & Equipment	.2299	.3010	.2580
3510	Health Care Equipment & Services	.1822	.2068	.1399
3030	Household & Personal Products	.1675	.2178	.1693
3520	Pharmaceuticals, Biotechnology & Life Sciences	.1653	.2117	.1866

Table 2 represents the corporate cash holding statistics across industries between the years 2005 and 2014. Panel A shows the least level of cash holding as labelled as bottom five industries whereas Panel B shows the highest level of cash holdings as labelled bottom five industries. This table exhibits that top five industries hold as much as ten times more cash as a percentage of total assets than the bottom five industries. For instance; Consumer Durables & Apparel industry has a median (mean) of 5.86 % (10.91%) with the lowest cash holdings, whereas software &services industry has a median (mean) of 23.14% (29.71%) with the highest cash holdings. Firms with more Research and Development (R & D) spending seem to hold more cash to cover these expenditures (Bates et al., 2009; Begenau and Palazzo, 2016). Begenau and Palazzo (2016) investigate US firms with approximately 85,000 observations between 1979 and 2013 and state that firms with intensive R & D expenditures during the period 1979-1983 accounted for 21% of the average cash assets to total assets ratio and that it increased 63 % between 2009 and 2013. Moreover, they state that the firms that did not spend R & D have an average cash holding only 7 % between 2009 and 2013.

5. Corporate Cash Holdings by Country

Table 3 exhibits the differences of corporate cash holding across related countries with giving statistical insights from cash holding and net cash holding ratios.

Table 3: Corporate Cash Holdings by Country

Country/variables	Mean	Median	Std Dev	Min	Max	N
Brazil						
CASH1	.0864	.0608	.0876	.0000	.7234	641
CASH2	.1823	.1390	.1558	.0001	.9587	632
Russia						
CASH1	.0605	.0434	.0602	.0004	.3373	485
CASH2	.1084	.0659	.1264	.0006	.8285	481
India						
CASH1	.0402	.0217	.0711	.0000	.7935	1209
CASH2	.1662	.1047	.1815	.0002	.9622	1151
China						
CASH1	.1897	.1476	.1514	0.0003	.8781	1301
CASH2	.2282	.1670	.1965	.0003	.9839	1228
Turkey						
CASH1	.0857	.0510	.0980	.0000	.5912	1985
CASH2	.1118	.0564	.1469	.0000	.9715	1961

Table 3 states the statistical results of cash holdings and net cash holdings levels by country. The mean cash ratio for Chinese firms has the highest cash levels. Uyar and Kuzey (2014) also report that on average, Turkish-listed nonfinancial firms hold 9,1 % of their total assets as cash and cash equivalents over the period 1997 and 2011. Moreover, Chen et al. (2012) investigate all firms listed on the Shanghai Stock Exchanges between the years 2000-2008 and state the mean (median) pooled sample ratio of cash to all noncash assets is 23,4% (15,7%). In 2005, the split share structure reform commenced in China and they report that the cash holding ratio significantly decrease.

Table results are also similar with the Ramiraz and Tadesse (2009) findings. They state the average cash holdings in Brazil, Russia, India and China are 9 %, 7 %, 6 %, and 18 %, respectively. Moreover, this table states that firms located in common law (India) has the lowest cash ratio rather than the firms located in civil-law countries (Brazil, Russia, China and Turkey). Furthermore, GDP per capita as a proxy for economic indicator has to be highlighted in that context. According to World Bank Governance Report 2015; in 2005, while GDP per capita (current US $) for Brazil is 4733.2, in 2014 GDP per capita (current US $) for Brazil increase 11384.6. For Russia, this indicator is 5323.5 in 2005 and 12735.9 in 2014. For India, GDP per capita is 729 and increase 1595 in 2014. For China, this proxy is 1740.1 and increase to 7593.3 in 2014. For Turkey, GDP per capita is 7117.1 in 2005 and increase to 10529 in 2014. This findings provides that Brazil has the highest average GDP per capita and India has the lowest in the sample period.

6. Summary and Conclusions

Due to the rising importance of the topic for both academic literature and practical grounds, this paper gives insights about corporate cash holding and net corporate cash holding levels in nonfinancial firms of BRIC countries and Turkey. This paper also sheds light on the role of economic development on corporate cash holdings. As Brazil has the highest average GDP per capita and India has the lowest in the sample period, findings also provide that less developed countries tend to hold more cash.

Each industry has its own characteristic as certain industries' earnings are highly volatile and are of high risk. This will affect the cash holdings decision indirectly. This study gives knowledge about the industry adjusted cash holding in BRIC and Turkey with giving the imputed cash methodology. The results of this cross-country model provide evidence that firms in Consumer Durables & Apparel industry has a median of 5.86 % with the lowest cash holdings, whereas software & services industry has a median of 23.14% with the highest cash holdings. This supports the idea that firms in high tech firms tend to hold more cash and firms with more (R & D) spending seem to hold more cash to cover these expenditures. Furthermore, this finding is considered to be indicative of the precautionary motive for cash and under financial constraint positions of firms since cash has been seen a relatively safe investment.

Several variables determine the corporate cash holdings, but it's not clear which dominant corporate cash holding theories, trade-off, financial hierarchy and agency theories, supports best the empirical findings. This is a primarily study which gives a clear understanding of the corporate cash holding levels. For further studies, this theories can be tested with panel data methodology and find out which of them best support the expectations. This study has been carried out in a robust manner as possible to ensure that its objectives have been successfully achieved. However, it has several limitations. Among the limitations are the missing values in the data derived from database. The sample size of the study is rather small compared to other emerged market studies and the sample period was rather limited as it covered ten years. In addition to what that has been investigated in this research, there are several other avenues to be explored in future research regarding the determinants of corporate cash holdings, agency problems and corporate governance mechanisms.

References

Al-Najjar B and Belghitar Y 2011, 'Corporate cash holdings and dividend payments: Evidence from simultaneous analysis', *Managerial and Decision Economics, Vol. 32, No. 4, pp. 231-241.*

Al-Najjar B 2013, 'The financial determinants of corporate cash holdings: Evidence from some emerging markets', *International Business Review, Vol. 22, No. 1, pp. 77-88.*

Ali A Yousaf S 2013, 'Determinants of cash holding in German market', *Journal of Business and Management, Vol. 12, No. 6, pp. 28- 34*

Almeida H, Campello M and Weisbach MS 2004, 'The cash flow sensitivity of cash', *The Journal of Finance, Vol.59, Issue. 4, pp. 1777-1804.*

Ameer S 2014, 'Financial constraints and corporate investment in Asian countries', *Journal of Asian Economics, Vol. 33, pp. 44-55.*

Anagnostopoulou S 2013, 'Cash holdings: Determining factors and impact on future operating performance for listed versus unlisted firms', *Review of Pacific Basin Financial Markets and Policies, Vol. 16, No. 2, pp. 1-47.*

Attig N, El Ghoul S, Guedhami O and Riseanu S 2013, 'The governance role of multiple large shareholders: Evidence on the valuation of cash holdings', *Journal of Management and Governance, Vol. 17, No. 2, pp. 419–451.*

Aras G 2015, 'The effect of corporate governance practices on financial structure in emerging markets: Evidence from BRICK countries and lessons for Turkey', *Emerging Markets Finance and Trade, Vol. 51, No. 2, pp. 5-24.*

Baumol WJ 1952, 'The transactions demand for cash: An inventory theoretic approach', *Quarterly Journal of Economics, Vol. 66, pp. 545-556.*

Bates T, Kahle K and Stulz R 2009, 'Why do U.S. companies hold so much more cash than they used to?', *Journal of Finance, Vol. 64, No. 5, pp. 1985-2021.*

Begenau J and Palazzo B 2016, 'Firm selection and corporate cash holdings', *Harvard Business School Working Paper, pp. 16-130.*

Belkhir M. Boubaker S and Derouiche I 2014, 'Control–ownership wedge, board of directors and the value of excess cash', *Economic Modelling, Vol. 39, pp. 110–122.*

Berger P and Ofek E 1995, 'Diversification's effect on firm value', *Journal of Financial Economics, Vol. 37, pp. 39–65.*

Borhanuddin R and Ching P 2011, 'Cash holdings, leverage, ownership concentration and board independence: Evidence from Malaysia', *Malaysian Accounting Review, Vol. 10, No. 1, pp. 63-88.*

Brisker ER Çolak G and Peterson DR 2013, 'Changes in cash holdings around the S&P 500 additions', *Journal of Banking & Finance, Vol. 37, pp. 1787-1807.*

Cetenak EH and Vural G 2015, 'Business group affiliation and financial constraints: Investment-Cash flow sensitivity of Turkish business groups', *Journal of Economics, Finance and Accounting (JEFA), Vol. 2, No. 3, pp. 313-330.*

Chen YR 2008, 'Corporate governance and cash holdings: Listed new economy versus old economy firms', *Corporate Governance, Vol. 16, No. 5, pp. 430-442*

Chen SS Chou RK and Chou S 2009, 'The impact of investment opportunities and free cash flow on financial liberalization: A cross-Firm analysis of emerging economies', *Financial Management, pp. 543-566*

Chen Q, Chen X, Schipper KX and Yongxin 2012, 'The sensitivity of corporate cash holdings to corporate governance', *Working paper series, pp. 1-45.*

Chen D, Li S, Xiao JZ and Zou H 2014, 'The effect of government quality on corporate cash holdings', *Journal of Corporate Finance, Vol. 27, pp. 384-400.*

Chen X, Sun Y and Xu X 2015, 'Free cash flow, over-Investment and corporate governance in China', *Pacific-Basin Finance Journal, pp. 1-44.*

Chen Y. Dou PY. Ghon R. Truong C and Veeraraghavan M 2015, 'National culture and corporate cash holdings around the world', *Journal of Banking & Finance, Vol. 50, pp. 1–18.*

Dittmar A. Mahrt-Smith J and Servaes H 2003, 'International corporate governance and corporate cash holdings', *Journal of Financial and Quantitative Analysis, Vol. 38, No. 1, pp. 111-133.*

Egimbaeva B 2013, *'Corporate investment and cash flow sensitivity: Evidence from Turkey'.* Unpublished Master Dissertation, Dokuz Eylul University, Izmir.

Gill A and Shah C 2012, 'Determinants of corporate cash holdings: Evidence from Canada', *International Journal of Economics and Finance, Vol. 4, No. 1, pp. 70-79.*

Hall T, Mateus C and Mateus I 2014, 'What determines cash holdings at privately held and publicly traded firms? Evidence from 20 emerging markets', *International Review of Financial Analysis, Vol. 33, pp. 104–116.*

Harford J 1999, 'Corporate cash reserves and acquisitions', *Journal of Finance, Vol. 54, pp. 1969-1997*

Jensen M and Meckling W 1976, 'Theory of the firm: Managerial behavior, agency costs and ownership structure', *Journal of Financial Economics, Vol. 3, No. 4, pp. 305-360.*

Jensen M 1986, 'Agency costs of free cash flow, Corporate Finance, and Takeovers', *American Economic Review, Vol. 76, No. 2, pp. 323-329.*

Kuan T, Li C and Chu S 2011, 'Cash holdings and corporate governance in family-controlled firms', *Journal of Business Research, Vol. 64, pp. 757-764.*

Kuan T, Li C and Liu S 2012, 'Corporate governance and cash holdings: A quantile regression approach', *International Review of Economics and Finance, Vol. 24, pp. 303–314.*

Kusnadi Y and Wei KC 2011, 'The determinants of corporate cash management policies: Evidence from around the world', *Journal of Corporate Finance, Vol. 17, pp. 725–740.*

Lee KW and Lee CF 2009, 'Cash holdings, corporate governance structure and firm valuation', *Review of Pacific Basin Financial Markets and Policies, Vol.12, No. 3, pp. 475–508.*

Masood A and Shah A 2014, 'Corporate governance and cash holdings in listed non-financial firms in Pakistan', *Business Review, Vol. 9, No. 2, pp. 48-73.*

Miller MH and Orr D 1966, 'A Model of the demand for money by companies', *Quarterly Journal of Economics, Vol. 80, No. 3, pp. 13-435.*

Myers SC and Majluf NS 1984, 'Corporate financing and investment decisions when firm have information that investors do not have'. *Journal of Financial Economics, Vol. 13, No. 2, pp. 187–221.*

Opler T, Pinkowitz L, Stulz R and Williamson R 1999, 'The determinants and implications of corporate cash holdings', *Journal of Financial Economics, Vol. 52, pp. 3–46.*

Pinkowitz L, Stulz R and Williamson R 2006, 'Does the contribution of corporate cash holdings and dividends to firm value depend on governance? A Cross-country analysis'. *Journal of Finance, Vol. 61, pp. 2725–2751.*

Seifert B and Gönenç H 2016, 'Creditor Rights, Country Governance, and Corporate Cash Holdings'. Journal of International Financial Management Accounting: 27, 65–90.

Subramaniam V, Tony TT, Heng Y and Zhou X 2011, 'Firm structure and corporate cash holdings', *Journal of Corporate Finance, Vol. 17, pp. 759-773.*

Uyar A and Kuzey C 2014, 'Determinants of corporate cash holdings: evidence from the emerging market of Turkey', *Applied Economics, Vol. 46, No. 9, pp. 1035–1048.*