The Impact of National Culture on Working Capital Management

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ABSTRACT

National culture might explain variations in working capital management, as proxied by the cash conversion cycle. Using 81,585 firm-year observations across 46 countries during 1998–2010, this study confirms that working capital management is associated positively with power distance but negatively with individualism and masculinity. According to the results of several interactions, these effects become even more notable for firms in emerging markets, that engage in fewer international activities, that belong to a non–high-tech sector, and that reside in countries with less effective regulatory enforcement or English common law. In general, these findings reinforce the importance of national culture for determining the effects of firm- and country-level factors on working capital management policies.

Keywords: National culture; Working capital management; Cash conversion cycle; Individualism; Power distance; Religion.

JEL Classification: G12.

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"Different countries' cultures affect attitudes toward working capital management."

—Andrew Sawers, 2012

1. INTRODUCTION

Working capital management is an important topic for corporate finance. To measure the quality of firms' working capital management, most prior research uses the length of the cash conversion cycle (CCC), or the net trade cycle, as a proxy (e.g., Gitman, 1974; Baños-Caballero et al., 2010, 2014). This cycle covers the time from the firm's actual capital spending on required resources for production to the moment it earns cash receipts from the sale of its products. Therefore, the cycle combines accounts receivable, inventories, and accounts payable—all important components of net operating working capital. When the CCC grows longer, it implies that the firm is managing its working capital less efficiently and may even require additional capital financing or suffer increased risks of bankruptcy.

If the world were homogeneous and managers were rational, the length of the CCC generally should be the same worldwide. According to a recent PwC survey though,[1] its length and that of its various components, including the receivable conversion cycle, inventory conversion cycle, and payment deferral period, all differ across countries, even within the same industry. For example, the measure of day sales outstanding in South European countries is longer than that in Germany or North American countries. So what factors drive such differences in working capital management strategies? And how can multinational firms control their liquidity across countries if they operate globally?

Hill et al. (2010) and Baños-Caballero et al. (2010) argue that the length of the CCC, and thus the quality of working capital management, depends on firm-specific

[1] Available at: http://www.pwc.com/gx/en/business-recovery-restructuring-services/working-capital-management/working-capital-survey/2015/assets/global-working-capital-survey-2015-report.pdf.

factors, such as its internal capital, the availability and cost of external financing, and bargaining power with suppliers and customers. Other research provides evidence that institutional factors contribute to financial decision making about capital structure or cash holdings (e.g., Chen et al., 2015; Fauver and McDonald, 2015). However, few studies examine whether institutional factors, such as culture and regulation, might shape the strategies managers use to control and manage their firms' working capital.

By undertaking a cross-cultural analysis, we expand prior research on the determinants of working capital management to examine whether national culture can explain variations in working capital management around the world. For this cross-cultural analysis, we use Hofstede's (2001) four main cultural dimensions: power distance, individualism, masculinity, and uncertainty avoidance. Then we test whether specific firm-, industry-, or country-level variables moderate the links between national culture and working capital management. Our analysis ultimately signifies that studying working capital management without addressing national culture leads to inaccurate results and an inefficient model.

Some of these findings are particularly interesting. Using data across 46 countries for the period 1998–2010, we determine that power distance correlates positively with the length of the CCC, but individualism and masculinity relate negatively to the net trade period, after we control for firm- and country-level factors. Managers in more individualistic or masculinist countries thus help implement effective working capital management, whereas managers in higher power distance countries ineffectively control the optimal level of working capital. These relations also become stronger for certain types of firms, such as those in emerging markets, involved less in international activities, belonging to a non–high-tech sector, or in countries with less effective regulatory enforcements or English Common Law. With these factors, we develop a detailed framework that firms can use to manage their working capital.

In turn, this study details the unique payment terms for customers and suppliers when managers differ in their culture. Furthermore, we document that national culture, according to Hofstede's (2001) dimensions, can explain significant variation in firm liquidity across countries. These findings are robust to alternative measures of national culture and a comprehensive set of control variables. This article also identifies how the effect of national culture on working capital management varies with different degrees of market development, internationalization, industry structure, legal environments, and regulation enforcement. Finally, our interdisciplinary study adds to literature on firms' working capital management policies and provides new insights into the effect of national culture on the extent of change in firms' payment terms for customers and suppliers across nations.

In Section 2, we provide a brief literature review and present our main hypothesis. Then we describe the data gathered from our extensive sample and present the descriptive statistics. Section 4 contains the empirical analysis and our findings. Finally, we offer some conclusions and implications.

2. LITERATURE REVIEW & HYPOTHESES

2.1 Literature review

Prior studies of working capital management fall into three main categories. First, researchers focus on the relationship of the cash conversion cycle with firm profitability (e.g., Soenen, 1993; Deloof, 2003; García-Teruel and Martínez-Solano, 2007a). Such studies suggest that firms can maximize their profitability, and firm value, if they can improve their working capital management, whereas they predict a negative relation between firms' profitability and their CCC. For example, Deloof (2003) analyze a sample of Belgian firms and find a negative, linear, contemporaneous relation between net working capital and operating performance. Baños-Caballero et al. (2012) identify

an optimal working capital level that maximizes the profitability of a sample of small- and medium-sized Spanish firms. With a sample of U.K. companies between 2001 and 2007, Baños-Caballero et al. (2014) instead propose an inverted U-shaped relation between investment in working capital and firm performance, which implies an optimal level of investment in working capital that balances costs and benefits and maximizes the firm's value. Furthermore, Aktas et al. (2015) provide evidence that efficient working capital management encourages firms to redeploy their underutilized corporate resources to value-enhancing uses, such as growth investments, that can lead to superior firm performance. In their sample of U.S. corporations from 1990 through 2006, Kieschnick et al. (2013) show that, on average, an additional dollar invested in net operating working capital is worth less than a dollar held in cash. Additional increases in net operating working capital then would reduce stock returns, if the firms were unable to acquire additional capital from external finance.

Second, another stream of research examines factors that significantly influence corporate investments in net operating working capital. Baños-Caballero et al. (2010) show that firms with greater growth opportunities, leverage, investments in fixed assets, or returns on assets adopt more aggressive working capital policies. Conversely, older firms or those with greater cash flows suffer poor working capital management. According to Hill et al. (2010), sales growth, sales uncertainty, costly external financing, and financial distress encourage firms to pursue more aggressive working capital strategies. Firms with greater internal financing capacity and superior capital market access instead employ more conservative policies.

Third, some studies explore the role of trade credit in firms faced with financial distress, especially in emerging markets. Cuñat (2007) suggests that trade credit represents about 41% of the total debt and half the short-term debt in U.K. medium-sized firms. Love et al. (2007) also find an important effect of financial crises on trade

credit in emerging economies during the 1990s. According to Molina and Preve (2009), firms increase their trade receivables when they have profitability problems but cut those trade receivables when they confront cash flow challenges; Molina and Preve (2012) also provide evidence that firms in financial distress use significantly more trade credit to substitute for alternative sources of financing. Analyzing a panel of 116,000 Chinese firms, Ding et al. (2013) conclude that active working capital management can be a means for financially constrained firms to mitigate their constraints. Across all three lines of research though, few studies examine the effect of informal institutions, including culture or shared values, or of institutional quality, such as rule of law or regulations, on working capital management policies.

2.2 Hypotheses

Culture is a system of shared values, beliefs, and attitudes that affect individual perceptions, preferences, and behaviors. This system differentiates the members of one group from those of another (Hofstede, 2001). Culture also includes a set of societal values that drive institutional forms and practices, linked to historical, economic, and ecological conditions. These societal values reflect institutional environments, in the form of legal and political systems, business operations, the nature of capital markets, and patterns of corporate ownership. Culture also affects local business practices and management styles, rooted in managers' mindsets, because it affects the values and beliefs that they hold toward coworkers, employees, stakeholders (e.g., suppliers, customers), and the organization.

Substantial research has confirmed the importance of national culture to financial decision making, in contexts as varied as capital structure (Zheng et al., 2012; Fauver and McDonald, 2015), foreign portfolio investments (Beugelsdijk and Frijns, 2010; Anderson et al., 2011; Aggarwal et al., 2012), foreign direct investment (Tang, 2012; Siegel et al., 2013), cash holdings (Chang and Noorbakhsh, 2009; Chen et al., 2015),

merger and acquisitions (Frijns et al., 2013), and so on. The most popular means to capture cultural traits across countries is the cultural framework provided by Hofstede (2001), which includes four main dimensions: power distance, masculinity–femininity, individualism–collectivism, and uncertainty avoidance. Prior evidence suggests that individualism and uncertainty avoidance have the most significant explanatory power in relation to financial decisions (Kirkman et al., 2006). We therefore analyze whether cultural differences in managers' attitudes affect their decisions about working capital management; with this empirical evidence, we examine whether differences in the lengths of cash conversion cycles can be explained by these four cultural dimensions.

2.2.1 Power distance

Power distance refers to the extent to which people believe that power and status are distributed unequally. This dimension is a measure of dependence relationships in a country, or how people conform with authority. With greater power distance, a society's level of inequality would be endorsed by followers as much as by leaders. Therefore, this measure might be defined as the extent to which a boss can determine the behavior of a subordinate and the extent to which a subordinate can predict the behavior of the boss. Management practices in low power distance cultures emphasize organizational learning, flexibility, and empowerment; management discipline in high power distance cultures are associated with centralized decision making, authoritative leadership, and close monitoring. Subordinates expect to be consulted in low power distance societies but told what to do in high power distance societies.

In a working capital management setting, the power distance between firms and their partners (e.g., debtors and creditors) depends on those firms' bargaining powers. Larger firms generally have more negotiating power over their counterparts, which they can use to enforce their terms. For example, powerful firms might pay their suppliers later but collect from their customers earlier. The partners of these powerful firms in

low power distance countries likely express more open disagreement with such inequitable terms and take a more consultative role to negotiate terms, even with larger firms. For example, buyers in a high power distance culture might apply similar business practices to lengthen their payment periods. Because inventory management relates strongly to economic conditions and firm-specific operations though, we anticipate no relationship between the specific inventory conversion period and power distance. Instead, the long collection and deferred periods together lead us to predict:

Hypothesis 1. *There is a positive relationship between power distance and the length of the cash conversion cycle.*

2.2.2 Individualism

Individualism is the degree to which a society highlights the individual as opposed to the group. Individualist societies are more concerned with the importance of individual motivation and decision making rather than group decision making, and they offer compensation based on each individual's contribution. In collectivist societies, people are integrated into strong, cohesive groups that offer protection in return for loyalty. The compensation system often is based on group performance. In high-risk situations, groups are more risk averse than individuals, and group decisions overall exhibit less variance than do individual decisions (Shupp and Williams, 2008).

With the notion that autonomy is an ideal, in individualistic cultures, business relations are viewed as business transactions, rather than the family relationships that they appear to be in collectivistic societies. In an individualistic society, members may belong to ingroups, but they feel little connection to them (Triandis et al., 1988). Individualism also relates to overconfidence, in that people overestimate their own knowledge and ability, and to self-attribution biases, which prompt individuals to attribute success to their own talents and judgments but failure to bad luck or external factors (e.g., Chui et al., 2010). These traits can lead them to discount perceived

riskiness but also behave less in accordance with herding behaviors.

Regarding the relationship between individualism and international financial management, Gleason et al. (2000) argue that managers in individualist cultures often choose lower debt to maximize their own apparent success and enhance their own reputations. Conversely, Fauver and McDonald (2015) suggest that high levels of individualism relate to increased use of debt and that better firm-level governance can reduce cultural effects. Chen et al. (2015) provide empirical evidence that cash holdings are negatively associated with individualism, because managers are more confident about their firms' financial situation and underestimate the demand for cash.

On the basis of this evidence, we postulate that managers in more individualist societies seek their own self-interest when managing working capital. They are willing to act on their beliefs but do not feel responsible for helping their suppliers or customers. They seek to shorten their collection periods but lengthen their payment periods, implying a negative potential relation between individualism and the length of the CCC. But these financial managers also might be overconfident about their firm's financial conditions, such that they underestimate the importance of working capital management. If they want to enhance their reputations, they might seek to appear generous, by paying suppliers earlier or letting their customers have longer payment terms. In this case, we would expect a positive relation between individualism and the length of the CCC. Finally, managers in collectivistic societies view their suppliers and customers as ingroup members, such that they feel responsible to help them through financial difficulties. Because our arguments suggest different signs, we hypothesize broadly:

Hypothesis 2. *Individualism has an effect on the length of the cash conversion cycle.*

2.2.3 Uncertainty avoidance

Uncertainty avoidance refers to the extent to which people are uncomfortable with uncertain or unstructured situations that are unknown, surprising, or different from the

usual. A society high on uncertainty avoidance likely exhibits more complete accounting disclosures, less risk taking, lower ambition for personal advancement, and greater resistance to change (Aggarwal et al., 2012). People prefer clear rules of conduct, and firms' responses to uncertainties are operationalized by technology, rules, and rituals. Hofstede (2001) argues that organizational rituals include planning, control systems, writing and filing memos and reports, and the use of outside experts. Although Hofstede (2001) differentiates uncertainty avoidance from risk avoidance, subsequent studies often relate the two concepts. For example, Li et al. (2013) expect uncertainty avoidance to relate negatively to corporate risk taking, and Rieger et al. (2015) demonstrate that risk attitudes depend partly on cultural factors, including individualism and uncertainty avoidance.

Studies also implicitly confirm the link between uncertainty avoidance and financial decision making. For example, Chen et al. (2015) offer evidence that corporate cash holdings are positively associated with uncertainty avoidance, and Gleason et al. (2000) suggest that high uncertainty avoidance conforms with lower levels of debt usage, because more debt appears to increase firms' chances of bankruptcy. Chui et al. (2002) suggest that more conservative firms, a description that is similar to Hofstede's uncertainty avoidance, adopt lower corporate debt ratios, and they emphasize harmony within and among firms. Kwok and Tadesse (2006) also provide evidence that countries with higher uncertainty avoidance tend to rely on bank-based financial systems.

These arguments lead us to expect that managers from higher uncertainty avoidance societies prefer to use better control systems or planning to monitor their firms' working capital. They likely pay their suppliers as late as possible, so that they need less additional capital to finance their own working capital. By collecting quickly from customers, they also can avoid any uncertainty that might jeopardize their working capital management. Even customers with substantial bargaining power might not be

able to alter this collection policy. Yet these managers also likely use required control systems or performance indexes to monitor their inventory levels, because surplus inventories are associated with excess costs and require managers to raise more capital to carry them. Therefore, managers might prefer to reduce their inventory conversion period as much as possible to avoid uncertainty or tied-up capital. Consolidating these effects, we expect that managers in higher uncertainty avoidance societies seek to reduce the CCC manage their firms' working capital, so we predict:

Hypothesis 3. *There is a negative relationship between individualism and the length of the cash conversion cycle.*

2.2.4 Masculinity

Masculinity refers to the extent to which a society emphasizes traditionally masculine values, such as competitiveness, assertiveness, achievement, ambition, and the acquisition of money and other material possessions, rather than feminine values such as nurturing, helping others, not showing off, and caring for the quality of life. Societies with higher masculinity scores tend to adopt confrontation rather than cooperative behaviors and intellectual independence rather than moral obligation. The managers are performance driven and behave decisively and aggressively. They usually reach conclusions on their own, based on their judgment.[2] Conversely, societies with a feminine culture tend to be more team-oriented and participative. In a working capital management setting, managers in feminine societies may take business relations with their suppliers and customers more seriously and seek to make these links as cooperative as possible. Therefore, they likely are willing to relax their terms, pay their suppliers earlier, and collect receivables from their customers later. In contrast, in the

[2] Masculinity does not correlate with the other three dimensions (except uncertainty avoidance, with a statistically significant positive value in wealthier countries and a marginally significant negative value in poorer countries). Hofstede (2001) also argues explicitly that masculinity is entirely different from and should not be confused with individualism.

adversarial relationships that mark high masculinity societies, managers seek to hold sufficient liquidity to exploit investment opportunities faster, using aggressive collection policies or bargaining power over suppliers. However, we find no evidence to suggest a relationship between the specific element of inventory control and masculinity. Rather, our analysis implies:

Hypothesis 4. *There is a negative relationship between masculinity and the length of the cash conversion cycle.*

3. VARIABLES & DATA

Our sample comprises both country-level institutional variables and firm-level financial variables. We retrieved the firm-level financial data for our analysis from Worldscope and DataStream to calculate required parameters. These financial variables include accounts receivable, inventory, fixed assets, total assets, accounts payable, total liability, preferred stock, retained earnings, book value of equity, common shares outstanding, year-end stock price, net sales, cost of goods sold, and depreciation. We excluded any observations with negative or missing values. We also acquired country-level economic variables, including the economic growth rate and financial development, from the World Bank. The economic freedom index came from the Fraser Institute.

Following previous international finance studies (e.g., Baele and Inghelbrecht, 2006; Bekaert et al., 2007; Beuselinck et al., 2007), we used Industry Classification Benchmark (ICB) sector codes, also known as the FTSE Actuaries Classification System, to identify firms' industry membership. This system classifies individual firms to a range of 39 homogeneous industries. We followed Beuselinck et al. (2007) and excluded firms in the financial and utility industries (ICB codes 7000–8999), which could distort the analysis.

The dependent and independent variables we used to test our hypotheses are

summarized in the Appendix. We also required the sample to have non-missing values for all variables, and we trimmed our observations at the 1st and 99th percentiles to lessen the potential impact of outliers. The final sample thus consists of an unbalanced panel of 83,249 firm-year observations from 46 countries during 1998–2010. Table 1 contains the summary statistics for the variables reflecting each country.

3.1 Dependent variable

For comparability and replication purposes, we mimicked past studies (e.g., Shin and Soenen, 1998; Baños-Caballero et al., 2010) and relied on the cash conversion cycle to measure effective management of working capital: ([accounts receivable + inventories – accounts payable]/sales)×365. Firms with longer CCCs appear to hold excessive working capital in their operations and thus need greater liquidity.

3.2 Explanatory variables

The data about the four cultural dimensions for each country came from http://geert-hofstede.com/. Panel A of Table 1 indicates large variations in the power distance, individualism, uncertainty avoidance, and masculinity indexes (columns (4)–(7)), such that the power distance indexes range from 11 (Austria) to 104 (Malaysia), individualism spans from 13 (Columbia) to 91 (United States), uncertainty avoidance ranges from 8 (Singapore) to 112 (Greece), and the masculinity index shows values from 8 (Norway) to 95 (Japan). Because the four indices, which capture different aspects of culture, are time-invariant, they cannot identify changes to a culture over time (Kirkman et al., 2006), so we also included a robust test with alternative, updated cultural scores from the GLOBE project (House et al., 2004), Tang and Koveos (2008), and the World Value Survey in our model.

3.3 Control variables

In addition to the required cultural data, we included firm- and country-level control variables, such as cash flows, leverage, growth opportunities, size, fixed assets, market-

to-book ratio, economic growth, financial development, economic freedom, legal origins, and religion, in our model.

3.3.1. Firm level

The cash flows control variable implies a capacity to generate internal financial resources or a measure of cash conversion efficiency. Prior studies provide mixed results regarding the relationship between working capital management and cash flows. Chiou et al. (2006) suggest that firms with greater cash flows have better working capital management, but cash flows have a negative influence on working capital requirements. Baños-Caballero et al. (2010) find that firms with greater cash flows have a longer cash conversion cycle, and Chen et al. (2015) assert that the more cash flows firms have, the greater their cash holdings, perhaps due to the lower cost of funds invested in working capital. However, Hill et al. (2010) suggest that firms with greater internal financing capacity adopt more conservative working capital policies. Love et al. (2007) also report a direct correlation between net trade credit and cash flow for a sample of firms in emerging markets. If net working capital increases, the firm must tie up more money, which decreases their free cash flows. In turn, perhaps the optimization of working capital management minimizes working capital requirements, leading to an increase in firms' free cash flow. Noting these two contradictory lines of reasoning, the impact of cash flows (i.e., ratio of net profit plus depreciation to total assets) on the CCC is unclear.

Prior studies often use leverage to proxy for firms' financial constraints. If firms, especially small ones, face greater information asymmetries, they also suffer constrained financial resources and higher costs to obtain external funds. That is, the cost of funds invested in working capital is higher, and their CCC likely is longer. But if firms have good access to capital markets, they suffer weaker financial constraints and lower costs of external financing. Chiou et al. (2006) suggest that greater leverage

actually reduces the measure of working capital management, and Kieschnick et al. (2013) show that an investment in net operating working capital is more valuable if firms face financial constraints. Not only do Baños-Caballero et al. (2010) find that firms with lower leverage have longer cash conversion cycles, but Chen et al. (2015) also provide evidence that cash holdings relate negatively to leverage. Therefore, we expect a negative relation between the CCC and leverage; we measure leverage value as the ratio of total debt to total assets.

According to finance theory, firms with more growth opportunities exploit their available internal or external resources to finance required future capital. Greater growth potential may encourage managers to hold more cash and increase their short-term investments to take advantage of these valuable opportunities. Therefore, the more growth opportunities firms have, the more active their management of working capital. Prior studies, including those by Cuñat (2007), Hill et al. (2010), and Baños-Caballero et al. (2010), confirm the negative relationship between growth opportunities and working capital management. In particular, Cuñat (2007) determines that trade credit is higher for the firms that grow faster, and Hill et al. (2010) find that firms tighten their credit policy when they achieve planned levels of sales growth. Kieschnick et al. (2013) also suggest that additional investments in net operating working capital are more valuable to shareholders when future sales growth appears strong. Therefore, we expect a negative relationship between growth opportunities and the CCC in our model, for which we estimate growth opportunities by the ratio $(net\ \ sales_t - net\ \ sales_{t-1})/net\ \ sales_{t-1}$.

We use the natural logarithm of total assets as a proxy for firm size, a control variable often associated with financial constraints. Small firms usually face financial constraints, informational asymmetries, and poor recognition. With fewer financial resources to finance their daily operations, as Cuñat (2007) suggests, they likely rely

on trade credit from their suppliers, use all their borrowing capacity, and may have exhausted other available sources of finance. Thus, small firms that require more working capital face higher costs to finance. In contrast, larger firms often have access to more financial resources or external financial markets and can finance their working capital less expensively. Thus, as Kieschnick et al. (2013) reveal, the larger the firm, the longer its CCC (see also Chiou et al., 2006). Moreover, García-Teruel and Martínez-Solanoan (2007b) find that small firms rely heavily on short-term debts, due to their higher transaction costs, and Chen et al. (2015) indicate that firm cash holdings decrease with the firm's size. Financially constrained, small firms also appear more likely to save cash from their current cash flows to fund future investments (Kusnadi and Wei, 2011). Therefore, we anticipate that the CCC increases with firm size.

In Baños-Caballero et al.'s (2010) study, the relationship between tangible fixed assets and working capital management is unclear. On the one hand, investments in working capital may be crowded out by investments in fixed assets if firms have insufficient financial resources to finance both of them. On the other hand, firms with more fixed assets enjoy lower informational asymmetries and agency costs, such that their costs of investing in working capital should be lower. Thus they might have longer CCC. A great amount of fixed assets can serve as collateral for larger firms, but Bartholdy and Mateus (2008) confirm that the asset structure is the most important determinant of capital structures for small firms. Firms likely employ more short-term debt if they have insufficient, lien-free, collateralizable fixed assets. Cuñat (2007) affirms that trade credit use is greater among firms with low levels of collateralizable assets and liquid assets, whereas according to Baños-Caballero et al. (2010), firms with higher fixed assets are more active in their working capital management. Overall though, the empirical evidence provides mixed results, and the effect of tangible fixed assets on working capital management is unclear. We define this variable as the ratio of fixed

assets to total assets.

Finally at the firm level, firms with greater information asymmetries may experience a higher cost of external financing. The cash flows of long-term projects are hard to evaluate, and a conflict exists between firm insiders and outside investors. Thus, these firms would prefer to finance internally. Hill et al. (2010) argue that firms with financial constraints lower their optimal working capital level if a higher working capital level needs financing, which implies an additional expense. To measure the level of informational asymmetries, we follow Hill et al. (2010) and use the market-to-book ratio (i.e., value of the market value of equity plus total assets minus the book value of total equity divided by total assets) as a proxy. This value captures the effect of the firm's long-term potential growth. We expect that informational asymmetries have a negative effect on working capital management.

3.3.2. Country level

Molina and Preve (2009), among others, suggest that macroeconomic and financial market conditions might have an impact on investments in net operating working capital and trade credit. During periods of rapid economic expansion, more financial resources are available for firms to finance their required investments. Love (2003) also points out that the presence of financial constraints may deter economic growth and that economic development helps mitigate this problem. Therefore, lower financing costs allow firms to be less concerned with their level of working capital. In contrast, firms faced with higher external financing costs may try to squeeze cash from anywhere possible during an economic recession, such that managers may be more likely to control the level of working capital actively. Other studies find no relationship, positive or negative, between working capital management and economic conditions though. Baños-Caballero et al. (2010) find that interest rates and gross domestic product (GDP) growth have no effects on the CCC, as does Kieschnick et al. (2013). Perhaps this result

reflects the relatively short research period or the strong impact of firm-specific factors at the margin. To test whether working capital management is affected by economic development, we follow Pinkowitz et al. (2006) and include GDP growth as a control variable in the model.

Baños-Caballero et al. (2010) also claim that internal financial resources, including short-term finance and trade credit, are the only channel for firms to finance their required investments, because they either face financial constraints or have difficulties obtaining funding in long-term capital markets. If a country has a strong, well-functioning financial market, firms can acquire more capital at a lower cost to finance their daily operations and investments. Kim et al. (1998) find that firms with lower costs of external finance may maintain a lower level of financial working capital. We then would expect a longer CCC, with fewer opportunity costs. Yet other studies (e.g., Stulz and Williamson, 2003; Anita et al., 2007) suggest that the effects of national culture on financial decision making by businesses are reflected in the degree of development of the financial markets in each country. For example, Pinkowitz et al. (2006) show that cash holdings are valued more in countries with higher financial and economic development. Gugler et al. (2013) also provide evidence that financial development matters for the proper functioning of international capital markets. To test the impact of financial development on working capital management, we add the ratio of market capitalization to GDP, obtained from the World Bank, as a control variable. A country with a higher index value has a more developed capital market. We expect a positive relationship between financial development and the CCC, such that firms in countries with higher values for the financial development index likely exhibit longer cash conversion cycles.

As global markets become more integrated, more firms operate across national borders. Managing current assets and liabilities in such international settings, in ways

that reduce the funds tied up in working capital, thus is an important issue for managers. Despite financial globalization and expanded access to financial markets, some countries still restrict foreign investments and international capital flow. Conditional on such capital controls, firms may face financial constraints that prevent them from acquiring the capital needed to finance their working capital or long-term investments. Laeven (2003) provides cross-country evidence that firms are less financially constrained in countries with more developed or liberalized financial markets. In particular, Forbes (2007) shows that Chilean firms experienced significant financial constraints during the period that the country implemented capital controls. To measure the effects of such controls on working capital management, we follow Ferreira and Miguel (2011) and use the economic freedom index to measure the restrictions that countries impose on capital flows. This index, created by the Economic Freedom Network, ranges from 0 to 10, such that a lower rating implies more restrictions on foreign capital transactions. We expect a positive relationship between the economic freedom index and the CCC.

Many studies document how the legal context can predict financial development and other policy outcomes. Specifically, common law countries offer stronger legal protection to outside investors—both shareholders and creditors—than do countries with other legal traditions (La Porta et al., 1998). Investors also value a firm's total cash holdings more negatively when the firm is headquartered in a country with an uncertain legal environment (i.e., weak legal protections; Pinkowitz et al., 2006). Stronger legal protections thus may help firms efficiently reduce their investments in working capital, suggesting a relationship between the nation's legal origins and the CCC. Using a dummy variable obtained from La Porta et al. (1998), we assign this control variable a value of 1 if a country's company law or commercial code is English common law, and 0 otherwise.

Religion also is an important cultural factor, driving people's attitudes and values, which may have an impact on financial decision making and credit policy. For example, the Quran prohibits interest charged on a loan, and some fundamentalist countries apply similar prohibitions. Stulz and Williamson (2003) suggest that Catholic countries fail to protect the rights of creditors as well as Protestant countries, though Guiso et al. (2003) assert that Christian religions are positively associated with attitudes conducive to economic growth. Other studies (e.g., Barsky et al., 1997; Hilary and Hui, 2009) provide evidence that Protestants are generally more risk averse than Catholics. Firms with a more risk-averse corporate culture likely seek to avoid projects with more uncertain payoffs (i.e., prefer to generate more stable profits). Overall, we expect that firms operating in Christian countries manage their working capital actively, leading to a shorter cash conversion period. Furthermore, firms operating in Protestant countries should more aggressively seek to reduce any funds tied up in working capital, to provide sufficient liquidity for their operations, relative to those in Catholic countries. We identified the major religion of each country from the CIA World Factbook, Guiso et al. (2003), and Stulz and Williamson (2003). In turn, we used four dummy variables—Protestant, Catholic, Muslim, and Buddhist—that each take a value of 1 if a country's primary religion is the one indicated and 0 otherwise. Then we check for any relation between the religion and working capital management in the sample.

3.4. Mean values

With the exceptions of the number of observations and firms, the values in Panel A of Table 1 are all country means. Firms from the United States firms account for about 19% of the whole sample. To check the consistency of our results, we report regression results with and without U.S. firms, to ensure our analysis was not overly influenced by U.S. firms. The mean value of our dependent variable, the cash conversion cycle, appears in column (3). The overall mean was 97.61 days across 46 countries, but the

column shows the substantial variation in CCC: Ireland has the shortest cycle, at 41.76 days; Malaysia's is the longest, at 152 days. Also, Greece, Italy, France, and Spain exhibit longer trade periods than other European nations.

Panel A of Table 1 also shows the country-level mean values for the control variables. The sample mean cash flow to total asset ratio is 0.04; the mean leverage ratio is 0.57. Whereas the mean of sales growth opportunity is 0.39, the mean value for the natural logarithm of firm size is 14.35. Furthermore, we find mean values of 0.34 for the ratio of fixed assets to total assets, 1.4 for the market-to-book ratio, and 0.04 for the economic growth rate. Panel B of Table 1 reveals the correlation coefficients among the CCC, cultural variables, and key control variables. None of these correlations suggests that multicollinearity is a concern.

4. RESULTS

4.1 Baseline regression

We first examine whether national culture has an impact on firms' working capital management strategies. The measure of national culture reflects Hofstede's four culture indexes: uncertainty avoidance, individualism, masculinity, and power distance. Following Chen et al.'s (2015) methodology, our empirical specifications build on the following baseline model:

$$CCC_{i,t} = \beta_0 + \beta_1 PDI_i + \beta_2 IDV_i + \beta_3 MAS_i + \beta_4 UAI_i + \gamma \cdot Controls_{i,t} + Ind_{j,t} + Yr_t + \varepsilon_{i,t}, \quad (1)$$

where *i* and *t* denote the firm and year, respectively; j indicates the industry; *Ind* and *Yr* capture industry and year fixed effects, respectively; and ε is the error term. The dependent variable is the cash conversion cycle, and the independent variables are the four cultural dimensions, power distance (PDI), individualism (IDV), masculinity (MAS), and uncertainty avoidance (UAI). The control variables are the cash flow, leverage, growth opportunity, size, fixed assets, market-to-book ratio, economic growth, financial

development, economic freedom, legal origins, and the four religion dummies. For this regression, we used pooled ordinary least squares with t-statistics computed using standard errors, robust to clustering at the firm level and heteroscedasticity.

Table 2 contains the empirical regression results. For brevity, we do not report the coefficients for the industry and year dummies. Rather, in columns (1)–(6), we present the empirical results stemming from the full sample, then repeat these results for the sample that excludes U.S. firms in columns (7)–(12). The estimated coefficients of each individual cultural dimension, in columns (2)–(5) and columns (8)–(11), are all statistically different from 0 at the 1% level.

We examine the full effect of these four cultural indexes on working capital management across countries in columns (6) and (12). Except for uncertainty avoidance, the cultural indexes retain their signs and are statistically different from 0 at the 1% level after we control for firm- and country-level characteristics. Specifically, individualism and masculinity indicate the same sign and estimated coefficient values. Power distance contributes to a longer CCC for non-U.S. firms, and a one-unit change in power distance leads the CCC to change from 15.38 days in column (6) to 18.2 days in column (12). In contrast with the magnitude of the coefficients for individualism and masculinity, power distance contributes more explanatory power for working capital management across countries, for both the full and the non-U.S. samples.

In support of our hypotheses, the proposed model confirms the strong relationship between national culture, proxied by power distance, individualism, and masculinity, and working capital management. Managers in countries with greater power distance extend their trade credit periods to finance their business operations, and this finding is particularly strong when we exclude U.S. firms from the model. Managers in countries with higher individualism or masculinity indexes adopt aggressive working capital policies to maximize their own success or enhance their own reputations. This finding

may reflect Malmendier and Tate's (2005) suggestion that sufficient internal funding can enable overconfident managers to invest more, thereby increasing investment distortions, because these managers view external funds as unduly costly. Our model is also in line with Chang and Noorbakhsh's (2009) suggestion that firms hold more cash and liquid balances in countries where the people are culturally masculine.

The effects of the firm- and country-level control variables on the CCC are notably consistent with our predictions. As Table 2 shows, most of the firm-level control variables (i.e., cash flows, leverage, size, fixed assets, and market-to-book ratio) reveal negative, statistically significant coefficient values; all of them are statistically significant at the 1% level. However, growth opportunity has no impact on the CCC. Instead, firms with larger cash flows, higher leverage, more investments in fixed assets, or greater market-to-book ratios exhibit more aggressive working capital policies and thus shorter cash conversion periods. The coefficient values in column (7) are much greater than those in column (1), and they remain negatively and statistically significant. This finding implies that the length of non-U.S. firms' CCC is more affected by their own firm characteristics. Most of them aggressively manage their working capital, granting priority to resources they have generated internally.

Four country-level control variables also are statistically significant: financial development, economic freedom, legal origins, and religion. The CCC relates positively to financial development and Muslim nations, but negatively to economic freedom, legal origins, and Buddhist, Catholic, and Protestant religions. The coefficient values in column (7), relative to those in column (1), grow smaller, but with the same sign. Our results indicate that non-U.S. firms' working capital management can be explained primarily by economic freedom and religion. As we expected, religion influenced the effectiveness of working capital management, such that firms in Protestant countries maintain lower levels of trade credit than those in Catholic countries. Compared with firms in Buddhist,

Protestant, and Catholic countries, firms in Muslim countries offer significantly extended trade credit periods. If we treat religion as a subset of national culture, we confirm that working capital management policy is affected by culture.

4.2 Interaction of firm and country attributes

In addition to these main effects, we anticipate that some firm or country characteristics modify the significance of national culture for working capital management. We therefore analyze the role of several firm and country characteristics, as represented by five pertinent attributes: emerging market, internationalization, high technology, rule of law, and legal origins. We posit that firms in emerging markets, with global operations, operating in high technology, in countries with stronger investor protections, or in countries with better legal protections exhibit a weaker relation between their national culture and the effectiveness of working capital management.

First, existing evidence indicates the market structures, institutional environment, and financial flexibility of emerging markets may contribute to higher return volatilities, according to their difference from those aspects in developed markets. Opler et al. (1999) find that more volatile returns are associated with greater cash balances. Accordingly, we divide countries into developed versus developing countries, using information from the International Monetary Fund. A dummy variable, EM, takes a value of 1 if a country is classified as an emerging market, and 0 otherwise.

Second, when they undertake sophisticated internationalization activities, firms adjust their financial practices to cope with uncertainties in politics, business, institutions, and local customs. Campbell et al. (2013) find that investors behave as if foreign cash balances in uncertain business environments were subject to greater liquidity concerns, and Desai et al. (2008) provide evidence that multinational firms reduce their leverage in response to foreign political risks. Ramirez and Tadesse (2009) also argue that the effects of culture on firms' financial decisions likely reflect the moderating effects of

multinationality. To determine if a firm's internationalization influences the relation between its national culture and its working capital management, we followed past international business literature (e.g., Reeb et al., 1998) and captured a firm's exposure to the foreign environment with two measures: (1) the ratio of foreign sales to total sales and (2) the ratio of foreign assets to total assets. The dummy variable MNC then equals 1 if both ratios are equal to or greater than 10%, and 0 otherwise.

Third, Joos and Plesko (2005) and Beuselinck et al. (2007) argue that firms' membership in high- versus low-technology sectors affects their earnings patterns and the association between accruals and cash flows. Opler et al. (1999) and Bates et al. (2009) also report that cash holdings correlate positively with R&D expenditures. We expect that firms in high-technology sectors behave differently in their working capital management than low-technology firms. Following Beuselinck et al. (2007), we include *High_Tech*, a dummy variable equal to 1 if the firm belongs to one of the six following ICB sectors: aerospace & defense (2710), pharma & biotech (4570), fixed line telecom (6530), mobile telecom (6570), software & computer services (9530), or technology hardware & equipment (9570). It equaled 0 otherwise.

Fourth, as La Porta et al. (1998) demonstrate, the rule of law is an indicator of the effectiveness of the regulatory enforcement. Firms in countries with a higher rule of law index should manage their working capital more effectively. Fifth, past studies also confirm that firms in countries with better investor protection, as measured by rule of law, hold less cash (e.g., Dittmar et al., 2003; Ferreira and Vilela, 2004). To determine whether the legal system modifies the effect of culture on trade credit policies, we acquire country-level data about the rule of law from the World Bank (Kaufmann et al., 2010); we also use legal origins as a proxy for legal environments.

We present our results in Table 3. According to column (1), only individualism and uncertainty avoidance reduce the length of the CCC for firms in non-emerging markets.

Adding the effect of emerging markets reveals that the interaction between national culture and emerging markets significantly magnifies the impacts on working capital management. The coefficients for LN(HF_PDI) × EM and LN(HF_IDV) × EM are positive; the coefficients of LN(HF_UAI) × EM and LN(HF_MAS) × EM are negative. All these values are significant at the 1% level. Because factors in emerging markets (e.g., legal systems, country-level governance, overall evolution of financial markets) are less developed than in developed markets, firms in these emerging markets follow local customs and traditions to manage their working capital.

Three cultural dimensions retain the same coefficient sign, whereas the effect of individualism × emerging markets on working capital management reveals a changed sign, from negative to positive, compared with the results in Table 2. That is, managers in emerging countries with a higher individualism index are more overconfident and more likely to underestimate the importance of working capital management. As we predicted, they accordingly exhibit a willingness to help their suppliers by paying earlier or their customers by providing longer payment terms, to enhance their own reputations.

In column (2), the power distance, individualism, and masculinity indexes exert important influences in terms of controlling the length of the CCC for firms without global operations. When firms participate in global operations though, the coefficient value of power distance × MNC and of masculinity × MNC are significant at the 1% level. Overall, the effects of national culture, including power distance and masculinity, on working capital management appear to weaken among global firms. We posit that because cultural differences increase as firms engage in more global operations, it increases the difficulty associated with managing foreign operations. Therefore, firms with foreign operations may follow internal rules of thumb, rather than local conditions, when managing their working capital.

The results in column (3) show that decisions by low-tech firms can be explained by power distance, individualism, and masculinity. When we add High_Tech to our model analysis, its coefficient value of -62.865 is statistically significant, so firms in high-technology sectors show shorter CCCs and aggressive management of their working capital. The interaction terms in column (3) are positive and significant at the 1% level. In particular, the influence of power distance on working capital management for high-tech firms is significantly stronger, but the effects of individualism and masculinity become smaller. On the basis of our analysis, we predict that industry characteristics in high-tech sectors (e.g., shorter product life cycles, value-added products, large variations in equipment and materials, larger firm sizes) can explain this phenomenon.

The coefficient values of LN(HF_PDI) × Rule_of_Law and LN(HF_IDV) × Rule_of_Law in column (4) are negative and statistically significant at the 1% level; the coefficient of LN(HF_MAS) × Rule_of_Law is positive and significant at the 10% level. Our results thus suggest that a higher index for the rule of law weakens the effects of power distance and masculinity on the trade credit period but magnifies the impact of individualism on working capital management. The rule of law refers to the extent to which agents have confidence in and abide by the rules of society, as well as the quality of contract enforcements, property rights, the police, and the courts. Our model thus implies that managers in higher power distance cultures who tend to lengthen their payment terms or shorten their receivables may be thwarted by high quality contract enforcements, as signaled by the higher index for the rule of law. This greater value of the rule of law also encourages managers in individualistic countries to manage their working capital aggressively.

In column (5), we examine whether the legal environment can change the effect of the national culture on working capital management. In French, German, and Scandinavian civil-law countries, firms actively manage their working capital; these

countries have higher power distance, individualism, and masculinity indexes. But firms in countries marked by higher uncertainty avoidance tend to defensively manage their liquidity. Adding the common law dummy variable reveals four interaction variables between cultural dimensions and legal origins that are statistically significant at the 1% or 5% level. Our consolidated findings are analogous to the results in Table 2. English common law appears to deepen the effect of national culture on firms' working capital management. The combined results from columns (4) and (5) thus suggest a subtle relation between culture and legal protection, but legal protection still tends to moderate the link between national culture and working capital management.

With these interaction effects, we demonstrate that the relation between national culture and working capital management is more notable for firms residing in emerging markets, firms involved less in international activities, firms belonging to a non–high-tech sector, or firms residing in countries with less effective regulatory enforcement or English common law traditions.

4.3 Robustness tests

We performed several tests to conform the robustness of our findings. With a random-effect panel regression estimated by generalized least squares, we sought to address the potential omitted variable problem. In column (1) of Table 4, the regression results suggest a positive relation between power distance and the CCCs but a negative relation between the trade credit period and uncertainty avoidance or masculinity.

Three alternative cultural frameworks also help confirm the robustness of our model. Thus, similar to Chen et al. (2015) and Dodd et al. (2015), we used the existing societal practice indexes from the GLOBLE project (House et al., 2004), which extends Hofstede's four cultural dimensions to nine cultural values to capture each country's national culture. The GLOBE cultural framework also differentiates societal practices (as is) from societal values (ought to be). The nine dimensions are performance orientation,

future orientation, gender egalitarianism, assertiveness orientation, institutional collectivism, family collectivism, power distance, humane orientation, and uncertainty avoidance. Although some cultural dimensions are similar between Hofstede and the GLOBE, they differ significantly in their conceptions and methodologies. We collected country scores for our sample using power distance, family collectivism, uncertainty avoidance, and assertiveness orientation from the GLOBE study as proxies for Hofstede's power distance, individualism, uncertainty avoidance, and masculinity indexes, respectively. Following Chen et al. (2015), we created a GLOBE-based individualism index, defined as '1 – the natural logarithm of family collectivism index'. The other three indexes were transformed by their natural logarithms. According to column (2) of Table 4, the four GLOBE proxies are statistically significant at the 1% level. The estimated coefficients for the GLOBE power distance and uncertainty avoidance variables are positive; the GLOBE individualism and masculinity variables are negative in the model. Only the uncertainty avoidance sign is not consistent across the GLOBE and Hofstede versions. These results show that the length of the CCC is positively associated with power distance and uncertainty avoidance but negatively related to individualism and masculinity.

We also employ the cultural values suggested by Tang and Koveos (2008) to assess the relation between the CCC and national culture. Noting that cultural indices do not capture changes over time (Kirkman et al., 2006), these authors updated Hofstede's cultural dimensions according to changing economic climates, reasoning that changes in economic conditions are sources of cultural dynamics. Several other studies have applied Tang and Koveos's (2008) cultural scores too (e.g., Beugelsdijk and Frijns, 2010; Chen et al., 2015; Dodd et al., 2015). In column (3), the coefficient values are significant at 1%, and the empirical results match our findings in Table 2.

Finally, we used the cultural values from the World Value Survey (WVS), which covers 113 societies and spans six waves, taken from 1981 to 2014. We follow Berry et al.'s (2010, appendix 1) method to calculate national cultural scores. The time-varying data lessen the problem of time-invariant characteristics. We ran the same regression; as the results in column (4) show, the proxies for power distance, individualism, and uncertainty avoidance are significant. Therefore, natural culture measured in the WVS still exerts an influence on the CCC. Yet we find a positive coefficient sign for uncertainty avoidance, in contrast with the Table 2 results. Perhaps people grow more trusting as they deal with one another more, such that managers extend their trade credit period. Finally, we find no statistically significant evidence that masculinity relates to firms' working capital management.

5. CONCLUSIONS

With a large, cross-country sample from 1998–2010, we examine whether cultural differences are important determinants of working capital management strategies. National culture can be reflected in the culture dimensions of power distance, individualism, uncertainty avoidance, and masculinity; we use the cash conversion cycle to proxy for the effectiveness of working capital management. The shorter this CCC, the more effectively firms manage their working capital. Our empirical results indicate that power distance relates positively to the CCC, whereas individualism and masculinity relate negatively to it.

In addition to providing new evidence of the links between national culture and finance, we make three main contributions. First, we document that Hofstede's (2001) national culture dimensions can explain significant variation in firm liquidity; these findings even are robust to three alternative measures of national culture, as well as a comprehensive set of control variables. Second, this article reveals that the effect of national culture on working capital management varies with different degrees of market

development, internationalization, industry structure, legal environments, and regulation enforcement. Third, with this interdisciplinary study, we extend literature on firms' working capital management policies and provide new insights into the effect of national culture on how firms adjust their payment terms for their customers and suppliers.

As a practical implication of our research, we recommend that managers in firms exposed to foreign environments acknowledge the importance of culture for determining the impact of firm- and country-level factors on required working capital, before choosing optimal working capital policies to satisfy their firms' requirements.

Appendix: Variables in the regression models

Variable Description	Measurement	Source
Cash conversion cycle (CCC)	(Account receivable + inventories + accounts payable)/sales×365	Worldscope and author's calculation
Power distance (HF_PDI)	Natural logarithm of Hofstede's power distance index	http://www.geert-hofstede.nl
Individualism (HF_IDV)	Natural logarithm of Hofstede's individualism index	http://www.geert-hofstede.nl
Masculinity (HF_MAS)	Natural logarithm of Hofstede's masculinity index	http://www.geert-hofstede.nl
Uncertainty avoidance (HF_UAI)	Natural logarithm of Hofstede's uncertainty avoidance index	http://www.geert-hofstede.nl
Cash flow	(Net income + depreciation)/total assets	Worldscope and author's calculation
Leverage	Total liability/total assets	Worldscope and author's calculation
Growth opportunity	(Current year sales – previous year sales)/previous year sales	Worldscope and author's calculation
Total assets	Natural log of total assets	Worldscope and author's calculation
Fixed assets	Fixed assets/total assets	Worldscope and author's calculation
Market-to-book ratio	(Book value of total liability + market value of total equity)/book value of total assets	Worldscope and author's calculation
Rule of law	World Bank measure of rule of law	WGI, World Bank
Economic growth	GDP growth (annual %)	WDI, World Bank
Financial development	Market capitalization of listed companies (% of GDP)	WDI, World Bank
Economic freedom	Natural logarithm of the Fraser Institute measure of economic freedom	http://www.freetheworld.com
Emerging market	1 for emerging markets and 0 otherwise	IMF
Internationalization of the firm	1 if both ratios of foreign sales to total sales and foreign assets to total assets of the firm are equal to or greater than 10%, and 0 otherwise	Worldscope
High-technology firms	1 if firm belongs to one of 6 high-tech industries (aerospace & defense, pharma & biotech, fixed line telecom, mobile telecom, software & computer services, technology hardware & equipment), and 0 otherwise	Beuselinck et al. (2007)
Legal origin	1 if the legal origin of a country's company law or commercial code is English common law, and 0 otherwise	La Porta et al. (1998)
Buddhist	1 for Buddhist countries, and 0 otherwise	Guiso et al. (2003); CIA World Factbook 2010
Muslim	1 for Muslim countries, and 0 otherwise	Same as above
Catholic	1 for Catholic countries, and 0 otherwise	Same as above
Protestant	1 for Protestant countries, and 0 otherwise	Same as above

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Table 1 Summary statistics

Panel A: Descriptive statistics

Country	Number of Firm-years	Number of firms	CCC	HF PDI	HF IDV	HF UAI	HF MAS	Cash flow	Leverage	Growth Opp.	Size	Fixed assets	Market-to-book	Economic growth	Financial develop.	Economic freedom	Rule of law	Legal origins	Religion	EM
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Argentina	267	32	102.59	49	46	86	56	0.07	0.50	0.23	13.43	0.47	1.40	0.03	0.30	6.33	-0.60	0	Catholic	1
Australia	2,474	400	79.42	36	90	51	61	0.00	0.53	1.10	12.02	0.33	1.06	0.03	1.17	8.00	1.75	1	Protestant	0
Austria	342	38	99.54	11	55	70	79	0.09	0.58	0.93	13.01	0.36	1.36	0.02	0.27	7.66	1.86	0	Catholic	0
Belgium	438	56	82.15	65	75	94	54	0.08	0.63	0.12	13.19	0.30	1.61	0.02	0.66	7.48	1.30	0	Catholic	0
Brazil	382	96	112.49	69	38	76	49	0.08	0.57	0.24	14.45	0.34	4.59	0.04	0.56	6.23	-0.31	0	Catholic	1
Canada	1,462	261	56.56	39	80	48	52	0.02	0.53	0.88	13.16	0.36	1.27	0.02	1.13	8.16	1.74	1	Catholic	0
Chile	681	75	115.17	63	23	86	28	0.09	0.44	0.40	19.48	0.47	1.48	0.04	1.03	7.77	1.25	0	Catholic	1
China	2,598	348	115.14	80	20	30	66	0.06	0.53	0.25	15.52	0.41	1.73	0.10	0.67	6.07	-0.42	0	Atheist	1
Colombia	122	18	112.19	67	13	80	64	0.05	0.34	0.13	21.08	0.46	0.91	0.03	0.32	5.99	-0.64	0	Catholic	1
Czech Republic	28	4	47.47	57	58	74	57	0.11	0.41	0.85	17.56	0.57	1.41	0.03	0.24	7.01	0.85	0	Atheist	0
Denmark	635	74	90.98	18	74	23	16	0.08	0.55	0.12	14.57	0.35	1.84	0.01	0.61	7.84	1.90	0	Protestant	0
Finland	771	80	85.98	33	63	59	26	0.09	0.53	0.14	12.94	0.32	1.77	0.02	1.14	7.79	1.94	0	Protestant	0
France	2,185	316	103.12	68	71	86	43	0.06	0.63	0.14	13.05	0.20	1.44	0.02	0.80	7.27	1.38	0	Catholic	0
Germany	2,800	355	92.78	35	67	65	66	0.05	0.62	0.32	12.92	0.28	1.45	0.01	0.47	7.61	1.65	0	Protestant	0
Greece	314	81	126.25	60	35	100	57	0.05	0.60	0.14	12.63	0.43	1.27	0.00	0.46	7.12	0.74	0	Orthodox	0
Hong Kong	4,769	789	106.18	68	25	29	57	0.03	0.49	0.61	14.13	0.32	1.30	0.04	4.17	8.97	1.39	1	Indigenous	0
Hungary	83	10	62.73	46	80	82	88	0.09	0.45	0.06	18.07	0.49	1.37	0.02	0.25	7.05	0.86	0	Catholic	1
India	8,886	1,748	128.33	77	48	40	56	0.08	0.62	0.40	14.97	0.40	1.42	0.08	0.81	6.37	0.09	1	Hindu	1
Indonesia	1,830	254	95.11	78	14	48	46	0.05	0.67	0.56	20.79	0.44	1.07	0.04	0.31	6.37	-0.75	0	Muslim	1
Ireland	203	22	41.76	28	70	35	68	0.06	0.62	0.11	13.46	0.34	1.48	0.04	0.53	7.96	1.62	1	Catholic	0
Israel	266	63	90.41	13	54	81	47	0.06	0.61	0.14	14.15	0.27	1.27	0.04	0.82	7.06	0.89	1	Judaism	0
Italy	1,273	143	112.92	50	76	75	70	0.04	0.62	0.16	13.25	0.23	1.38	0.01	0.39	7.08	0.54	0	Catholic	0
Japan	1,136	434	64.85	54	46	92	95	0.05	0.53	0.06	17.63	0.32	1.55	0.00	0.79	7.70	1.29	0	Buddhist	0
Malaysia	3,845	497	152.34	100	26	36	50	0.06	0.46	0.17	12.72	0.41	1.09	0.05	1.38	6.77	0.49	1	Muslim	1
Mexico	515	67	99.07	81	30	82	69	0.08	0.50	0.15	16.40	0.50	1.52	0.02	0.27	6.68	-0.48	0	Catholic	1
Netherlands	626	72	78.96	38	80	53	14	0.09	0.60	0.13	13.67	0.29	1.61	0.02	1.00	7.77	1.75	0	Catholic	0
New Zealand	318	41	77.52	22	79	49	58	0.10	0.50	0.19	12.94	0.46	1.58	0.03	0.40	8.42	1.84	1	Protestant	0
Norway	535	89	80.45	31	69	50	8	0.06	0.61	0.21	15.34	0.44	1.49	0.01	0.55	7.50	1.91	0	Protestant	0
Pakistan	531	101	92.20	55	14	70	50	0.09	0.59	0.22	15.75	0.54	1.30	0.04	0.21	5.88	-0.83	1	Muslim	1
Peru	216	35	84.98	64	16	87	42	0.14	0.44	0.17	13.73	0.49	1.62	0.05	0.49	7.41	-0.66	0	Catholic	1
Philippines	515	74	102.64	94	32	44	64	0.07	0.52	0.19	16.07	0.47	1.11	0.05	0.48	6.96	-0.47	0	Catholic	1

Country	Number of Firm-years	Number of firms	CCC	HF PDI	HF IDV	HF UAI	HF MAS	Cash flow	Leverage	Growth Opp.	Size	Fixed assets	Market-to-book	Economic growth	Financial develop.	Economic freedom	Rule of law	Legal origins	Religion	EM
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Poland	518	110	79.00	68	60	93	64	0.09	0.50	0.18	13.38	0.37	1.56	0.04	0.31	6.93	0.51	0	Catholic	1
Portugal	173	31	74.22	63	27	99	31	0.05	0.71	0.10	13.72	0.32	1.32	0.01	0.39	7.27	1.07	0	Catholic	0
Russia	272	59	89.01	93	39	95	36	0.11	0.53	0.24	17.84	0.50	1.60	0.04	0.68	6.33	-0.87	0	Orthodox	1
Singapore	2,926	420	109.89	74	20	8	48	0.05	0.51	0.21	12.22	0.33	1.24	0.06	1.77	8.71	1.58	1	Buddhist	0
South Africa	1,137	138	60.93	49	65	49	63	0.12	0.54	0.42	14.98	0.34	1.75	0.03	2.00	6.84	0.10	1	Protestant	1
South Korea	5,675	764	99.09	60	18	85	39	0.06	0.53	0.32	19.63	0.38	1.14	0.05	0.68	7.33	0.90	0	Buddhist	0
Spain	558	81	108.59	57	51	86	42	0.07	0.58	0.17	13.41	0.35	1.61	0.03	0.82	7.47	1.20	0	Catholic	0
Sweden	957	137	95.65	31	71	29	5	0.06	0.57	0.54	15.31	0.24	1.77	0.02	1.04	7.47	1.86	0	Protestant	0
Switzerland	1,242	127	102.75	34	68	58	70	0.08	0.52	0.52	13.49	0.31	1.85	0.02	2.25	8.39	1.87	0	Catholic	0
Taiwan	3,960	566	100.98	58	17	69	45	0.07	0.46	0.31	16.24	0.37	1.31	0.05	1.31	7.54	0.87	0	Buddhist	0
Thailand	1,849	292	93.02	64	20	64	34	0.08	0.58	0.43	15.06	0.45	1.16	0.04	0.59	6.68	0.10	1	Buddhist	1
Turkey	1,015	152	120.88	66	37	85	45	0.08	0.55	0.36	12.41	0.38	1.35	0.04	0.30	6.35	0.05	0	Muslim	1
United Kingdom	4,975	672	77.58	35	89	35	66	0.04	0.59	0.46	12.04	0.30	1.66	0.02	1.30	8.17	1.68	1	Protestant	0
United States	15,227	2,542	75.95	40	91	46	62	-0.05	0.64	0.46	12.74	0.27	1.38	0.02	1.25	8.21	1.55	1	Protestant	0
Venezuela	55	7	88.58	81	12	76	73	0.08	0.37	0.22	13.60	0.58	0.70	0.02	0.04	4.85	-1.23	0	Catholic	1
Total/Mean	81,585	12,771	97.61	56.69	53.70	51.87	54.06	0.04	0.57	0.39	14.35	0.34	1.40	0.04	1.18	7.53	0.99			
STD DEV			86.55	19.60	29.27	20.96	13.84	0.34	0.50	6.37	3.01	0.22	4.07	0.04	0.93	0.86	0.77			

This panel reports summary statistics for all the countries in our sample. All values, with the exception of the number of firm years and firms, are country or sample means. The sample consists of 46 countries and covers the period from 1998 to 2010. The definitions and sources of all variables are provided in the appendix.

Panel B: Correlation coefficients

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
CCC	(1)	1																		
Ln(HF_PDI)	(2)	0.186	1																	
Ln(HF_IDV)	(3)	-0.132	-0.663	1																
Ln(HF_UAI)	(4)	-0.047	-0.129	0.043	1															
Ln(HF_MAS)	(5)	-0.021	0.063	0.185	-0.016	1														
Cash flow	(6)	-0.011	0.057	-0.075	0.016	-0.041	1													
Leverage	(7)	-0.072	-0.043	0.078	0.012	0.016	-0.380	1												
Growth opportunity	(8)	-0.001	-0.010	0.009	-0.003	0.005	-0.026	0.005	1											
Size	(9)	-0.040	0.268	-0.507	0.288	-0.208	0.178	-0.064	-0.018	1										
Fixed assets	(10)	-0.182	0.167	-0.210	0.024	-0.038	0.083	-0.013	-0.002	0.212	1									

Market-to-book	(11)	-0.016	-0.016	0.020	0.001	-0.002	0.103	-0.111	0.008	0.032	-0.010	1								
Economics growth	(12)	0.096	0.420	-0.338	-0.211	0.008	0.064	-0.023	0.004	0.146	0.110	0.015	1							
Financial development	(13)	0.006	0.064	-0.072	-0.406	0.112	-0.019	-0.044	0.015	-0.161	-0.089	0.009	0.082	1						
Ln(Economics freedom)	(14)	-0.140	-0.509	0.336	-0.271	0.082	-0.074	-0.013	0.011	-0.307	-0.201	0.005	-0.315	0.574	1					
Legal origins	(15)	-0.014	-0.030	0.351	-0.541	0.329	-0.063	0.027	0.013	-0.410	-0.046	-0.012	0.048	0.370	0.269	1				
Buddhist	(16)	0.004	0.198	-0.608	0.066	-0.179	0.034	-0.053	-0.008	0.376	0.071	-0.019	0.087	-0.074	0.049	-0.289	1			
Catholic	(17)	-0.016	-0.033	0.146	0.339	-0.028	0.031	-0.007	-0.005	-0.041	-0.023	0.017	-0.161	-0.150	-0.031	-0.386	-0.200	1		
Muslim	(18)	0.113	0.390	-0.329	-0.015	-0.046	0.019	-0.019	-0.004	0.062	0.113	-0.020	0.050	-0.106	-0.361	0.005	-0.151	-0.129	1	
Protestant	(19)	-0.165	-0.732	0.747	-0.069	0.073	-0.091	0.060	0.010	-0.380	-0.181	0.012	-0.354	-0.018	0.452	0.325	-0.368	-0.313	-0.237	1

This panel reports correlation coefficients among CCC, cultural variables, and key control variables. The sample consists of 46 countries and covers the period from 1998 to 2010. The definitions and sources of all variables are provided in the appendix.

Table 2 Regressions of working capital management on national culture

	Full Sample						Sample Excluding U.S. Firms					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
LN(HF_PDI)		15.146 ***				15.375 ***		18.277 ***				18.204 ***
		(27.966)				(17.321)		(28.439)				(14.731)
LN(HF_IDV)			-8.101 ***			-4.466 ***			-7.969 ***			-4.55 ***
			(-6.8)			(-5.669)			(-6.883)			(-5.831)
LN(HF_UAI)				-5.735 ***		-2.279				-4.556 ***		-0.368
				(-3.665)		(-1.329)				(-2.707)		(-0.202)
LN(HF_MAS)					-5.89 ***	-6.497 ***					-5.214 ***	-6.111 ***
					(-4.638)	(-4.096)					(-4.423)	(-4.178)
Cash flow	-7.051 ***	-6.82 ***	-6.77 ***	-7.286 ***	-7.145 ***	-6.858 ***	-20.894 ***	-20.712 ***	-20.493 ***	-20.973 ***	-20.992 ***	-20.606 ***
	(-4.941)	(-4.898)	(-4.847)	(-5.04)	(-4.914)	(-4.92)	(-5.328)	(-5.355)	(-5.35)	(-5.338)	(-5.309)	(-5.345)
Leverage	-13.677 ***	-13.599 ***	-13.531 ***	-13.678 ***	-13.705 ***	-13.549 ***	-24.51 ***	-24.193 ***	-24.046 ***	-24.562 ***	-24.575 ***	-24.011 ***
	(-8.169)	(-8.196)	(-8.21)	(-8.164)	(-8.148)	(-8.19)	(-15.394)	(-15.104)	(-14.613)	(-15.374)	(-15.364)	(-14.778)
Growth opp.	-0.004	0.001	-0.004	-0.001	-0.004	0.002	0.011	0.018	0.011	0.014	0.012	0.018
	(-0.063)	(0.016)	(-0.065)	(-0.01)	(-0.066)	(0.035)	(0.15)	(0.238)	(0.151)	(0.187)	(0.154)	(0.247)
Size	-2.588 ***	-2.586 ***	-2.739 ***	-2.411 ***	-2.64 ***	-2.656 ***	-2.618 ***	-2.55 ***	-2.808 ***	-2.471 ***	-2.702 ***	-2.745 ***
	(-18.883)	(-19.445)	(-22.625)	(-13.803)	(-19.62)	(-15.698)	(-17.212)	(-17.629)	(-19.835)	(-13.62)	(-18.992)	(-16.409)
Fixed assets	-77.181 ***	-76.828 ***	-78.025 ***	-76.999 ***	-77.271 ***	-77.315 ***	-80.301 ***	-80.077 ***	-81.224 ***	-80.061 ***	-80.286 ***	-80.569 ***
	(-54.477)	(-54.687)	(-50.765)	(-52.812)	(-54.35)	(-52.14)	(-54.144)	(-53.691)	(-51.974)	(-53.589)	(-53.954)	(-53.083)
Market-to-book	-0.366 ***	-0.366 ***	-0.36 ***	-0.373 ***	-0.366 ***	-0.365 ***	-0.665 *	-0.664 *	-0.66 *	-0.675 *	-0.664 *	-0.662 *
	(-2.739)	(-2.761)	(-2.766)	(-2.753)	(-2.734)	(-2.789)	(-1.938)	(-1.942)	(-1.955)	(-1.948)	(-1.938)	(-1.96)
Economics growth	15.615	0.875	5.354	-6.388	13.347	-16.251	14.371	-2.412	3.019	-5.996	12.437	-12.738
	(0.805)	(0.047)	(0.26)	(-0.339)	(0.713)	(-0.881)	(0.66)	(-0.109)	(0.131)	(-0.283)	(0.592)	(-0.612)
Financial development	1.638 ***	0.433	0.289	1.68 ***	1.37 **	-0.608	1.007	-0.728	-0.277	1.162 *	0.86	-1.614 **
	(2.584)	(0.767)	(0.507)	(2.725)	(2.194)	(-1.024)	(1.481)	(-1.149)	(-0.458)	(1.667)	(1.296)	(-2.348)
LN(Economic Free)	-66.502 ***	-50.385 ***	-62.244 ***	-75.655 ***	-64.87 ***	-49.632 ***	-66.001 ***	-43.439 ***	-62.475 ***	-74.915 ***	-65.507 ***	-41.656 ***
	(-9.573)	(-7.073)	(-9.683)	(-8.78)	(-9.289)	(-5.196)	(-9.062)	(-5.564)	(-9.067)	(-7.88)	(-9.007)	(-3.829)
Legal origin	-3.392 ***	-5.175 ***	-1.006	-5.121 ***	-1.819	-2.839 **	-1.768	-3.117 ***	0.433	-3.339 **	-0.72	-0.753
	(-3.976)	(-6.013)	(-1.282)	(-4.984)	(-1.615)	(-1.967)	(-1.491)	(-2.641)	(0.407)	(-2.308)	(-0.523)	(-0.434)
Buddhist	-11.276 ***	-12.208 ***	-15.888 ***	-10.482 ***	-12.279 ***	-15.555 ***	-10.996 ***	-12.312 ***	-15.433 ***	-10.288 ***	-11.829 ***	-15.76 ***
	(-9.044)	(-10.146)	(-11.935)	(-9.694)	(-9.628)	(-13.247)	(-9.163)	(-10.202)	(-12.456)	(-9.178)	(-9.43)	(-11.851)
Catholic	-23.211 ***	-21.865 ***	-19.77 ***	-20.87 ***	-23.414 ***	-19.241 ***	-22.966 ***	-21.122 ***	-19.675 ***	-21.121 ***	-23.268 ***	-19.455 ***
	(-17.586)	(-16.503)	(-11.062)	(-12.03)	(-18.481)	(-9.225)	(-18.252)	(-16.262)	(-11.557)	(-12.569)	(-18.872)	(-9.587)
Muslim	10.557 ***	7.237 ***	6.469 **	10.385 ***	9.751 ***	3.977	10.026 ***	6.216 **	5.979 **	9.791 ***	9.249 ***	2.99
	(4.135)	(2.669)	(2.536)	(4.162)	(3.713)	(1.443)	(3.768)	(2.114)	(2.308)	(3.777)	(3.389)	(1.015)

Protestant	-38.591 ***	-31.944 ***	-33.576 ***	-36.825 ***	-39.621 ***	-29.513 ***	-35.195 ***	-25.96 ***	-30.451 ***	-34.189 ***	-36.635 ***	-24.894 ***
	(-24.734)	(-19.427)	(-14.467)	(-18.169)	(-24.609)	(-11.975)	(-29.603)	(-21.496)	(-16.098)	(-22.361)	(-27.13)	(-13.468)
Constant	376.109 ***	283.457 ***	400.226 ***	414.524 ***	397.276 ***	333.972 ***	403.609 ***	284.478 ***	429.327 ***	436.761 ***	424.83 ***	327.183 ***
	(31.132)	(24.978)	(29.897)	(21.305)	(34.458)	(16.078)	(32.496)	(21.073)	(31.646)	(21.243)	(38.232)	(13.119)
Industry and year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0.167	0.168	0.168	0.168	0.168	0.170	0.162	0.164	0.163	0.163	0.163	0.165
No. of observations	81,585	81,585	81,585	81,585	81,585	81,585	66,358	66,358	66,358	66,358	66,358	66,358

This table presents the regression results of working capital management on national culture. The dependent variables are cash conversion cycles (CCC), calculated as (accounts receivable + inventories + accounts payable)/Sales×365. The definitions and sources of all variables are provided in the appendix. The sample consists of 46 countries and covers the period from 1998 to 2010. We ran pooled ordinary least squares regressions, with *t*-statistics (in parentheses) computed using standard errors, robust to clustering at the firm level and heteroscedasticity. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 3 Regressions of working capital management on national culture, interacted with critical factors

	(1)	(2)	(3)	(4)	(5)
LN(HF_PDI)	-0.416	19.516 ***	12.898 ***	47.73 ***	-6.71 ***
	(-0.262)	(11.951)	(15.178)	(14.155)	(-4.228)
LN(HF_IDV)	-26.22 ***	-3.912 ***	-7.998 ***	-3.04 **	-16.451 ***
	(-16.784)	(-4.006)	(-8.502)	(-2.12)	(-16.597)
LN(HF_UAI)	-4.721 ***	-2.644	-1.964	2.78	11.957 **
	(-4.131)	(-1.328)	(-0.927)	(0.846)	(2.274)
LN(HF_MAS)	0.426	-9.022 ***	-8.984 ***	-5.939 *	-4.504 **
	(0.367)	(-4.224)	(-5.599)	(-1.947)	(-2.046)
LN(HF_PDI)*EM	70.555 ***				
	(8.527)				
LN(HF_IDV)*EM	36.882 ***				
	(9.836)				
LN(HF_UAI)*EM	-12.137 ***				
	(-4.871)				
LN(HF_MAS)*EM	-57.216 ***				
	(-29.247)				
EM	-154 ***				
	(-7.544)				
LN(HF_PDI)*MNC		-13.832 ***			
		(-5.482)			
LN(HF_IDV)*MNC		-0.073			
		(-0.076)			
LN(HF_UAI)*MNC		-1.142			
		(-0.653)			
LN(HF_MAS)*MNC		7.429 ***			
		(6.33)			
MNC		27.794 **			
		(2.225)			
LN(HF_PDI)*High_Tech			6.668 **		
			(2.242)		
LN(HF_IDV)*High_Tech			3.179 ***		
			(2.997)		
LN(HF_UAI)*High_Tech			3.413 **		
			(2.338)		
LN(HF_MAS)*High_Tech			2.86 ***		
			(3.773)		
High_Tech			-62.865 ***		
			(-4.271)		
LN(HF_PDI)*Rule_of_Law				-29.063 ***	
				(-14.733)	
LN(HF_IDV)*Rule_of_Law				-20.631 ***	
				(-18.293)	
LN(HF_UAI)*Rule_of_Law				-0.195	
				(-0.115)	
LN(HF_MAS)*Rule_of_Law				2.603 *	
				(1.769)	
Rule of Law				194.121 ***	
				(21.198)	
LN(HF_PDI)*Legal Origins					40.858 ***
					(22.271)
LN(HF_IDV)*Legal Origins					15.08 ***
					(5.459)
LN(HF_UAI)*Legal Origins					-19.278 ***
					(-3.027)
LN(HF_MAS)*Legal Origins					-14.784 **
					(-2.192)
Legal Origins					-85.263 ***
					(-3.525)

Control Variables	YES	YES	YES	YES	YES
Industry FE	YES	YES	NO	YES	YES
Year FE	YES	YES	YES	YES	YES
Adjusted R-squared	0.177	0.17	0.116	0.176	0.174
No. of observations	81,585	81,585	81,585	81,585	81,585

This table presents the regression results of the interaction effects between national culture and some critical factors. The dependent variables are cash conversion cycles (CCC), calculated as (accounts receivable + inventories + accounts payable)/sales×365. The definitions and sources of all variables are provided in the appendix. The sample consists of 46 countries and covers the period from 1998 to 2010. We ran pooled ordinary least squares regressions, with *t*-statistics (in parentheses) computed using standard errors, robust to clustering at the firm level and heteroscedasticity. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 4 Robustness tests

	Random-Effect Panel Regression	GLOBE	Tang and Koveos (2008)	World Value Survey
	(1)	(2)	(3)	(4)
Power Distance	17.653 ***	59.723 ***	7.487 ***	10.696 *
	(6.125)	(5.518)	(7.513)	(1.696)
Individualism	0.36	-43.078 ***	-21.776 ***	29.448 ***
	(0.165)	(6.307)	(-16.006)	(7.777)
Uncertainty Avoidance	-10.282 ***	35.705 ***	-18.023 ***	30.809 ***
	(-2.613)	(5.219)	(-4.716)	(10.672)
Masculinity	-7.225 *	-16.557 ***	-8.728 ***	-5.721
	(-1.748)	(-4.231)	(-8.235)	(-1.244)
Control Variables	YES	YES	YES	YES
Industry and Year FE	YES	YES	YES	YES
Adjusted R-squared	0.064	0.173	0.175	0.169
No. of observations	81,585	79,156	74,126	79,480

This table present the regression results of working capital management on national culture. The dependent variables are cash conversion cycles (CCC), defined as (accounts receivable + inventories + accounts payable)/sales×365. The definitions and sources of all variables are provided in the appendix. We ran pooled ordinary least squares regressions, with *t*-statistics (in parentheses) computed using standard errors, robust to clustering at the firm level and heteroscedasticity. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.