



UNIVERSIDADE D
COIMBRA

Yan Ming

**THE RELATIONSHIP OF CULTURE WITH
SHORT-TERM FINANCIAL MANAGEMENT**

*Dissertação no âmbito do mestrado em Contabilidade e Finanças,
orientada pelo Professor Doutor Paulo Miguel Marques Gama Gonçalves
e apresentada à Faculdade de Economia da Universidade de Coimbra*

Coimbra, junho de 2023



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Resumo

Está comprovado que as dimensões da cultura nacional têm um impacto significativo na gestão do capital circulante de uma empresa. Mas algumas das análises das ditas dimensões apresentaram resultados contraditórios. Para além disso, não foram identificadas as diferenças de desempenhos das dimensões da cultura nacional em diferentes condições económicas. Esta investigação utiliza dados de 26 países para o período 2007-2021. Neste contexto, são selecionadas as condições de expansão económica versus as condições de recessão económica e o período pré-covid versus o período covid, a fim de estabelecer a correlação entre a cultura nacional e a gestão do capital circulante.

Foi utilizado um modelo de regressão Pooled OLS para analisar o impacto das dimensões da cultura nacional. A framework das dimensões da cultura nacional de Hofstede é utilizado como variável independente para apresentar a cultura nacional. Seis outros indicadores ao nível da empresa e um indicador ao nível do país foram utilizados como variáveis de controlo. O ciclo de conversão de caixa foi utilizado para apresentar a eficiência da gestão do capital circulante. Os resultados confirmaram que a cultura nacional tem um impacto significativo na duração do ciclo de conversão de caixa. Duas das dimensões (Índice de distância ao poder, orientação a longo prazo versus orientação a curto prazo) da cultura nacional têm um impacto positivo na duração do ciclo de conversão de caixa, enquanto duas das dimensões (Individualismo versus Coletivismo, Índice de aversão à incerteza) têm um impacto negativo na duração do ciclo de conversão de caixa. A Indulgência versus Restrição apresentou resultados contrários no teste individual e no teste combinado A Masculinidade versus Feminilidade não teve qualquer impacto significativo na duração do ciclo de conversão de caixa.

Em seguida, foi gerado um modelo de regressão Pooled OLS com uma dummy de expansão e uma dummy de recessão para observar se existem diferentes desempenhos da cultura nacional em condições económicas de expansão e recessão. O resultado mostrou claramente que as dimensões da cultura nacional tiveram desempenhos diferentes nas diferentes condições de expansão e recessão económica.

Comparando o valor absoluto do coeficiente, Individualismo versus Coletivismo e Indulgência versus Restrição têm um maior impacto na duração do ciclo de conversão

de caixa na condição de expansão económica do que em condições de recessão económica. O Índice de aversão à incerteza e a orientação a longo prazo versus orientação a curto prazo têm um impacto maior na duração do ciclo de conversão de caixa em condições de recessão económica do que em condições de expansão económica. O Índice de distância ao poder apenas teve um desempenho significativo na condição de recessão económica, não sendo significativo na condição de expansão económica. A Masculinidade versus Feminilidade não teve qualquer impacto significativo na duração do ciclo de conversão de caixa e em qualquer outra condição económica.

Por último, foi gerado um modelo de regressão Pooled OLS com dummies temporais de Pré-covid e Covid para observar se existem diferentes desempenhos da cultura nacional nas condições económicas de Pré-covid e Covid internacional. Os resultados revelam claramente que as dimensões da cultura nacional tiveram desempenhos diferentes nas diferentes condições económicas da Covid internacional e da Pré-covid.

O Índice de distância ao poder e a Indulgência versus Restrição apenas apresentaram uma correlação significativa com a duração do ciclo de conversão de caixa na condição de Pré-covid, não sendo significante na condição de Covid Internacional. Comparando com o valor absoluto dos coeficientes, o Individualismo versus Coletivismo tem um maior impacto na duração do ciclo de conversão de caixa na condição de Pré-covid. O Índice de aversão à incerteza e orientação a longo prazo versus orientação a curto prazo têm um impacto maior na duração do ciclo de conversão de caixa na condição de Covid Internacional.

Palavras-chave: Cultura Nacional, Gestão do Capital Circulante, Ciclo de conversão de Caixa, Condição Económica

Abstract

It had been evidence that national culture dimensions have a significant impact on a company's working capital management. But some of the dimensions' analyses came out with contrary results. Also, the performance differences of national culture dimensions within different economic conditions are not identified. This research uses data across 26 countries for the period 2007-2021. Inside this, the economic expansion condition vs the economic recession condition, and pre-covid period vs covid period are selected, to establish the correlation between national culture and working capital management.

A pooled OLS regression model was used to analyze the impact of national culture dimensions. Hofstede's national culture dimensions framework is used as independent variables, to present national culture. Six other company-level indicators and one country-level indicator were used as control variables. The cash conversion cycle was used to present the efficiency of working capital management. Results confirmed that national culture has a significant impact on the length of cash conversion cycle. Two of the national culture dimensions (Power Distance Index, Long-term versus Short-term Orientation) have a positive impact on the length of cash conversion cycle. While two dimensions (Individualism versus Collectivism, Uncertainty Avoidance Index) have a negative impact on the length of cash conversion cycle. Indulgence versus Restraint showed contrary results in the individual test and combine test. Masculinity versus Femininity didn't perform any impact on the length of cash conversion cycle at any significant level.

Next, a pooled OLS regression model with an expansion dummy and recession dummy was generated to observe whether exist different performances of national culture with economic conditions of expansion and recession. The result presented clearly that national culture dimensions performed differently with the different conditions of economic expansion and economic recession.

Comparing the absolute value of the coefficient, Individualism versus Collectivism and Indulgence versus Restraint have a bigger impact on the length of cash conversion cycle in the condition of economic expansion than in the economic recession. Uncertainty Avoidance Index and Long-term versus Short-term Orientation have a bigger impact on the length of cash conversion cycle in the condition of economic

recession than in economic expansion. Power Distance Index only performed significantly in the condition of economic recession, while not significant in the condition of economic expansion. Masculinity versus Femininity didn't perform any impact on the length of cash conversion cycle at any significant level and any economic conditions.

At last, a pooled OLS regression model with time dummies of Pre-covid and Covid was generated to observe whether exist different performances of national culture with economic conditions of Pre-covid and international Covid. The result presented clearly that national culture dimensions performed differently with different economic conditions of International Covid and Pre-covid.

Power Distance Index and Indulgence versus Restraint only performed significant correlation with cash conversion cycle in the condition of Pre-covid, not significant in the condition of International Covid. Compare with the absolute value of coefficients, Individualism versus Collectivism has bigger impact on the length of cash conversion cycle in the condition of Pre-covid. Uncertainty Avoidance Index and Long-term versus Short-term Orientation have a bigger impact on the length of cash conversion cycle in the condition of International Covid.

Keywords: National Culture, Working Capital Management, Cash Conversion Cycle, Economic Condition

List of Abbreviations

CCC=Cash conversion cycle

CF=Cash Flow

DR=Debt Ratio

EG=Economic Growth

FS=Firm Size

FTA=Fixed to Total Assets

GLOBE= Global Leadership and Organizational Behavior Effectiveness

GO=Growth Opportunity

IDV=Individualism versus Collectivism

IVR=Indulgence versus Restraint

LTO=Long-term versus Short-term Orientation

MAS=Masculinity versus Femininity

PDI=Power Distance Index

QR=Quick Ratio

UAI=Uncertainty Avoidance Index

WCM=Working capital management

WVS= World Values Survey

List of Tables

Table 1 Summary of the Hypothesis.....	18
Table 2 Effect of National Culture Dimensions on CCC.....	29
Table 3 Effect of national culture dimension on CCC (in condition of economic expansion and economic recession).....	33
Table 4 Effect of national culture dimension on CCC (in condition of International Covid and Pre-covid).....	36
Table 5 Summary of the Hypothesis Results	41

List of Figures

Figure 1 Schwartz's cultural value orientation model	10
Figure 2 The cash conversion cycle.....	20

List of Appendix

Appendix 1 Descriptive Statistics for sample data

Appendix 2 Descriptive Statistics for panel data

Appendix 3. Histogram of CCC distribution

Appendix 4 Normality of Residuals

Appendix 5 Heteroskedasticity

Appendix 6 Linearity of national culture dimensions

Appendix 7 Pearson Correlation Matrix

Appendix 8 Hofstede's National Culture Dimensions

Appendix 9 Schwartz's National Culture Dimensions

Appendix 10 GLOBE National Culture Dimensions

Appendix 11 WVS dimension

Appendix 12 Effect of National Culture Dimensions (Schwartz) on CCC

Appendix 13 Effect of National Culture Dimensions (GLOBE) on CCC

Appendix 14 Effect of National Culture Dimensions (WVS) on CCC

Appendix 15 Effect of national culture dimension (Hofstede) on CCC (in condition of economic expansion and economic recession) within two consecutive business cycles

Appendix 16 Effect of national culture dimension (Schwartz) on CCC (in condition of economic expansion and economic recession)

Appendix 17 Effect of national culture dimension (Hofstede) on CCC (in condition of International Covid and Pre-covid) within two consecutive business cycles

Appendix 18 Effect of national culture dimension (Schwartz) on CCC (in condition of International Covid and Pre-covid)

Content

Acknowledgment.....	v
Resumo	vi
Abstract.....	viii
List of Abbreviations	x
List of Tables	xi
List of Figures.....	xii
1. Introduction.....	1
2. Literature Review	3
2.1 Working Capital Management.....	3
2.2 National Culture.....	6
2.2.1 Hofstede’s Cultural Framework.....	6
2.2.2 Schwartz’s Framework	9
2.2.3 GLOBE Project.....	11
2.2.4 World Value Survey	11
2.3 National Culture and Working Capital Management	12
2.3.1 Hofstede’s Cultural Dimensions and WCM	13
2.3.2 Performance in Different Economic Conditions	17
2.3.3 Summary of the Hypothesis.....	17
3. Research Design	19
3.1 Data Collection	19
3.2 Chosen Variables	20
3.2.1 Dependent Variables-Cash Conversion Cycle.....	20
3.2.2 Independent Variables -National Cultural Dimension.....	21
3.2.3 Control Variables.....	21
3.2.4 Economic Condition Definition.....	24
3.3 Estimation	25
3.3.1 Regression Model	25
3.3.2 Regression Model for Comparing Different Economic Conditions	25
3.3 Sample Description.....	27

3.3.1 Samples Original	27
3.3.2 Panel Data Descriptive Statistics	27
3.3.3 Normal Distribution Test	28
3.3.4 Heteroskedasticity and Linearity	28
3.3.5 Pearson Correlation Matrix.....	28
4. Results.....	29
4.1 Baseline Result	29
4.2 Additional Test	32
4.2.1 Economic Expansion VS Economic Recession.....	32
4.2.2 International Covid VS Pre-covid.....	35
4.3 Robustness Test	38
4.3.1 Robustness Test for Baseline.....	38
4.3.2 Robustness Test for the Economic Condition of Expansion and Recession .	39
4.3.2 Robustness Test for the Economic Condition of International Covid and Pre-	
covid	40
4.4 Summary of Hypotheses Results	40
5. Conclusion	43
Reference	45
Reference Website	53
Appendix.....	55

1. Introduction

Short-term financial management is an important part of corporate finance. Short-term financial management, frequently termed “working capital management (WCM)”, involves budgeting and making financial plans for one year or less. Managers, investors, and policymakers are concerned about working capital management because of its economic magnitude and impact on firm performance. Working capital management ensures the corporation has sufficient cash flow to fulfill its short-term debt obligations and operating expenses. Also, the effectiveness of working capital management can be measured using the Cash Conversion Cycle (CCC), many researchers use the length of CCC to measure the quality of working capital management (Baños-Caballero et al., 2012; Deloof, 2003; Demirgunes & Samiloglu, 2008; Gill et al., 2010; Lazaridis & Tryfonidis, 2006; Padachi, 2006; Rahman & Nasr, 2007).

There seem to be obvious differences in working capital management practices among different countries (Danske Bank & Ernst & Young, 2009; Koralun-Bereźnicka, 2014b; Sawers, 2012). As there are some differences in working capital management, it’s important to consider if national cultural factors influence the corporation phenomenon (Wu, 2016). Although many researchers have focused on working capital management, research in this area is rarely found, with only three research studies on the relationship between national culture and WCM. Boschker (2011) presented certain evidence for the connection between WCM efficiency and national culture (Boschker, 2011). The Impact of National Culture on Working Capital Management is also reported in 2016 (Katri & Tuuli, 2016; Wu, 2016).

Previous research already evidences the fact that national culture is an important factor to affect working capital management. However, different results were found between Hofstede’s culture dimensions and WCM. More additional research is needed to understand the complex correlations between them.

This research uses data across 26 countries for the period 2007-2021 to establish the correlation between national culture and working capital management (WCM). And for the long-time span data sample (2007-2021), the economic recession period versus the economic expansion period, and the international Covid period versus the Pre-covid

period are defined to verify if the correlation between national culture and the length of CCC will change in different economic conditions.

The research question is:

How does national culture influence working capital management during different economic conditions?

A lot of research in the field of working capital management and the companies' performance has been established, while country-level factors and the influence of different economic conditions are seldom researchers to research. Therefore, this study contributes by focusing on if the national cultural influence will be different in different economic conditions in terms of Hofstede's cultural dimensions from a multi-country perspective.

For managers in an international environment, understanding how WCM changes under different economic conditions and national cultures, helps to formulate different working capital policies for different countries.

The baseline result confirms that national culture significant correlation with the length of CCC, as same as the previous research. Additional tests for conditions of economic expansion and economic recession result in the national culture impacts differently on the length of CCC with different economic conditions. Another test for the condition of International Covid and Pre-covid results in the same conclusion as the previous test, the national culture impacts differently on the length of CCC between the condition of International Covid and Pre-covid.

The remainder of this dissertation is organized as follows. In chapter 2, theories, and early research about working capital management, and national cultures are presented, and hypotheses are formulated. In chapter 3, the methodology is discussed including research design, chosen variables, descriptive statistics, and some basic test results. In chapter 4, all the pooled OLS regression results for baseline, regression results with the condition of economic expansion VS economic recession, and condition of International Covid VS Pre-covid are reported and discussed. Also, the robustness tests that use different national culture frameworks and samples from different periods are reported. In chapter 5, conclusions are presented, also limitations of this study are conducted and some recommendations for the future are suggested.

2. Literature Review

2.1 Working Capital Management

Decisions relating to working capital and short-term financing are referred to as working capital management. Working capital management ensures the corporation has sufficient cash flow to fulfill its short-term debt obligations and operating expenses. By definition, working capital management implies short-term decisions generally, relating to the next one-year period-which are “reversible”. Working capital management research has been a subject of great interest to researchers and practitioners.

Working capital management is important because of its strong influence on company performance (Baños-Caballero et al., 2012; Deloof, 2003; Demirgunes & Samiloglu, 2008; Gill et al., 2010; Lazaridis & Tryfonidis, 2006; Padachi, 2006; Raheman & Nasr, 2007). It is important to understand how working capital works because it can help manager determines if the business has enough money to cover the cost. The importance of short-term financial decisions to a company’s value is considered by testing whether an extra euro invested in cash or net working capital is valued at less than one euro, alerting management not to underestimate the importance of cash holdings and working capital management; moreover, the results encourage investors to follow a company’s actions in this area to maximize their returns on investment (Autukaite & Molay, 2011). Baños-Caballero et al. (2012) analyze the relationship between working capital management and profitability for small and medium-sized enterprises (SMEs) by controlling for unobservable heterogeneity and possible endogeneity. And the results show that there is a non-monotonic (concave) relationship between working capital level and firm profitability (Baños-Caballero et al., 2012). Baños-Caballero et al. (2014) examines an inverted U-shaped relationship between working capital and firm performance in a sample of non-financial UK companies. That is, working capital investment and firm performance are positively correlated at low levels of working capital and negatively correlated at high levels of working capital. The research also found that the results hold when firms are classified according to various characteristics designed to measure the level of financial constraints that firms experience (Baños-Caballero et al., 2014).

CCC is an important metric for a business to determine how efficiently a company can convert its inventory into sales and cash (Baños-Caballero et al., 2010, 2014; Gitman, 1974). The effectiveness of working capital management can be measured using the Cash Conversion Cycle (CCC). CCC consists of Days Sales Outstanding, Days Sales Inventory, and Days Payable Outstanding.

Based on Deloof (2003), CCC could be calculated by the formula:

$$\text{CCC} = \text{Number of days accounts receivable} + \text{number of days inventory} - \text{number of days accounts payable}$$

Number of days accounts receivable = $(\text{accounts receivable} \times 365) / \text{sales}$

Number of days inventory = $(\text{inventories} \times 365) / \text{cost of sales}$

Number of days accounts payable = $(\text{account payable} \times 365) / \text{purchases}$

Previous researchers are widely focused on the relationship of CCC with firm profitability. It has been established that there is a significant negative relationship between the cash conversion cycle (CCC) and firm profitability. The result of Deloof (2003) suggests managers can reduce the days of accounts receivable and inventory to increase corporate profitability (Deloof, 2003). Nobanee et al. (2009) examine the relationship between working capital management, profitability, firm size, and industry type for firms in Japan. The shorter the cash conversion cycle, the stronger profitability of Japanese companies (Nobanee & Al Hajjar, 2009). Iqbal et al. (2014) used working capital as the independent variable and net operating profit as the dependent variable for a sample of Pakistani firms listed on the Karachi stock exchange and found that net operating profit is significantly negatively correlated with the average collection period, inventory turnover in days, average payment period, and cash conversion cycle (Iqbal et al., 2014). The objective of Singhanian et al. (2014) was to examine the relationship between the working capital management strategies of a firm and its profitability and also try to understand the influence of global macroeconomic conditions on them, they found that decreasing the number of days receivables and increasing the number of days payable, can improve the firm performance (Singhanian et al., 2014). Jahfer (2015) investigated those manufacturing companies in Sri Lanka for the period 2008 to 2013 that had a negative association between CCC and profitability but no evidence to prove significance (Jahfer, 2015). Chang (2018) conduct a global empirical analysis to evidence that even considering the endogenous problem, changes in macroeconomic

environments, and other problems that negative relationship between CCC and a firm's profitability and value remains exists (Chang, 2018). Seth et al. (2020) used a sample of 564 Indian manufacturing firms from the period 2008 to 2018, to empirically that through the improved working capital model, reducing the CCC of the firm could advance the firm's performance, and create efficiency in WCM (Seth et al., 2020).

Furthermore, there are some researchers have had different results as previous. Such as Baños-Caballero et al. (2014) examine an inverted U-shaped relationship between working capital and firm performance. That is, working capital investment and firm performance are positively correlated at low levels of working capital and negatively correlated at high levels of working capital. They also find that the results hold when firms are classified according to various characteristics designed to measure the level of financial constraints that firms experience (Baños-Caballero et al., 2014). Zakari et al. (2016) found a significant positive relationship between CCC and corporate profitability by collecting all the listed ICT firms from 2010-2014 on the floor of the Nigerian Stock Exchange (Zakari & Saidu, 2016).

Except for the wide discussion of the relationship between CCC and firm profitability, the determinate of working capital management practices and efficiency in terms of the cash conversion cycle has been of interest to the research (Deloof, 2003; Falope & Ajilore, 2009; Juan García-Teruel & Martínez-Solano, 2007; Vishnani & Shah, 2007).

Filbeck & Krueger (2005) discovered that working capital in different industries is significantly different across time (Filbeck & Krueger, 2005). Baños-Caballero et al. (2014) analyzed whether the optimal working capital level is sensitive to alternative measures of financial constraints (Baños-Caballero et al., 2014). Afrifa et al. (2014) found that firm size has an influence on the working capital management level (Afrifa et al., 2014). Afrifa (2016) used unbalanced panel data regression analysis on a sample of 6,926 non-financial small and medium enterprises in the UK for the period from 2004 to 2013 to get a result indicating that a strong concave relationship between net working capital and performance in the absence of cash flow; and when considering cash flow, the relationship becomes convex (Afrifa, 2016). Laghari & Chengang (2019) investigate the relationship between working capital management and corporate performance with financial constraints using a large panel sample of Chinese listed firms over the period of 2005-2015 (Laghari & Chengang, 2019). Firm size, debt ratio, growth of the

company, economic growth, inflation, shareholder's wealth et all are factors that researchers focus on associated with firm's working capital management (Kieschnick et al., 2013; Zariyawati et al., 2010).

Throughout the literature, most researchers are trying to empirical the relationship between working capital management and a firm's value in a single country. It is difficult to find clear empirical confirmation of the direct relationship between the working capital and the country specificity in the hitherto financial literature (Koralun-Bereźnicka, 2014a). Until, by comparing the correlation across size groups in countries, Koralun-Bereźnicka (2014) got that both country specificity and firm size would affect the working capital of companies. Baños-Caballero et al. (2019) used a sample of firms from 30 countries to make a contribution that investor protection, the country's financial and economic development play an important role in the value of net working capital (Baños-Caballero et al., 2019).

2.2 National Culture

Hofstede et al, define culture as follows(G. H. Hofstede et al., 2010. p.06):
“Culture is the collective programming of the mind that distinguishes the members of one group or category of people from others”.

2.2.1 Hofstede's Cultural Framework

What so-called Hofstede's cultural framework has gone through three stages of research and development. To a certain extent, it solves the problems in cross-border communication or cross-border business.

In the first stage, between 1967 and 1973, Hofstede (1983) conducted a large survey study of differences in national values among the IBM Corporation's global subsidiaries, compared the responses of a sample of 117,000 IBM-matched employees to the same attitude survey in different countries. This preliminary analysis identified systematic differences in national culture along four main dimensions: power distance (PDI), individualism (IDV), uncertainty avoidance (UAI), and masculinity (MAS) (G. Hofstede, 1983).

In the second stage, the result of a survey by Michael Harris Bond and colleagues conducted (Chinese Culture Connection, 1987), among students in 23 countries, using a survey instrument developed with employees and managers, led Hofstede to an additional new fifth dimension: long-term orientation (LTO), initially called Confucian dynamism (Hofstede, 1991, 2001; Hofstede & Bond, 1988).

The last stage was in 2010, Minkov's (2007) World Values Survey data analysis of 93 representative samples of national populations allowed a new calculation of the fifth (Minkov, 2007) and led Geert Hofstede to identify a sixth last dimension: indulgence versus restraint (G. H. Hofstede et al., 2010).

All six dimensions are labeled as follows:

1. Power Distance Index (**PDI**).
2. Individualism vs. Collectivism (**IDV**).
3. Uncertainty Avoidance Index (**UAI**).
4. Masculinity vs. Femininity (**MAS**).
5. Long-term Orientation vs. Short-term Orientation (**LTO**).
6. Indulgence vs. Restraint (**IVR**).

Power Distance Index

Power distance refers to the degree to which people with low status in a society accept the unequal distribution of power in a society or organization (G. Hofstede, 1994; G. H. Hofstede et al., 2010). Due to the different understandings of power in various countries, this dimension has great differences (G. H. Hofstede et al., 2010). Some cultures pay more attention to authority, status, seniority, age, etc., while in some cultures their importance is relatively low (G. H. Hofstede et al., 2010). The power distance difference is reflected by the power distance index.

Individualism vs. Collectivism

The individualism/collectivism dimension measures whether a society is concerned with the interests of the individual or the interests of the group. In an individualistic society, the relationship between people is loose, and people tend to care about themselves and their small families; while in a collectivist society, they pay attention to the relationship within the group and care about the extended family, strong group

relations can give people continuous protection, while the individual must be absolutely loyal to the group, individualism has no obvious difference between in-group and out-group, while collectivism has obvious difference between in-group and out-group (G. Hofstede, 1983, 1994, 2011; G. H. Hofstede et al., 2010).

In Hofstede's research, the individualism index value measures a society's individualism/collectivism tendency. The larger the value of this index, it means that the individualism tendency of the society is obvious, and the smaller the value, it means that the society's tendency towards collectivism is more obvious.

Uncertainty Avoidance Index

Uncertainty avoidance refers to whether a society avoids and controls uncertainty through formal channels when it is threatened by uncertain events and unconventional environments (G. Hofstede, 1983).

The degree of uncertainty avoidance can be reflected by the Uncertainty Avoidance Index. Cultures with a high degree of avoidance place more emphasis on authority, status, seniority, age, etc., and try to avoid these by providing greater occupational security, establishing more formal rules, not tolerating extreme views and behaviors, and trusting absolute knowledge and expert evaluation. Cultures with low avoidance are more tolerant of abnormal behavior and opinions, have fewer rules and regulations, and allow a variety of different opinions to exist at the same time in terms of philosophy and religion (G. H. Hofstede et al., 2010).

Masculinity vs. Femininity

The dimension of masculinity and femininity mainly depends on whether a society represents more male qualities such as competitiveness and assertiveness or represents female qualities such as humility and caring for others, as well as the definition of male and female functions. Masculinity/femininity is measured by Masculinity Index. The larger the value of the Masculinity Index, the more obvious the masculinity of the society and the more prominent the masculinity; otherwise, the more prominent the femininity of the society (G. Hofstede, 1998, 2011; G. H. Hofstede et al., 2010).

Long-term Orientation vs. Short-term Orientation

The dimensions of long-term orientation and short-term orientation refer to the degree to which members of a culture accept delaying the satisfaction of their material,

emotional, and social needs. This dimension shows the extent to which moral life is worth pursuing without requiring any religion to justify it. Long-term Orientation/Short-term Orientation is measured by the Long-Term Orientation Index. The Long-Term Orientation Index has a strong relationship with economic growth across countries. In the late 20th century, the East Asian economy developed by leaps and bounds, and scholars believe that the long-term orientation is one of the main reasons for promoting development (G. Hofstede, 2001; G. Hofstede & Bond, 1988; G. H. Hofstede et al., 2010; G. Hofstede & Hofstede, 2005).

Indulgence vs. Restraint

The dimension of indulgence and restraint refers to the degree to which a society allows people's basic needs and desires to enjoy life and enjoyment. The larger the value of Indulgence, means that the society has little restraint on itself, and the greater the tolerance of the society to self-indulgence, the less people restrain themselves. This is the latest added dimension (G. H. Hofstede et al., 2010).

2.2.2 Schwartz's Framework

Hofstede and Bond proposed the original cultural value model and conducted a series of pioneering research work (G. Hofstede, 2001), Schwartz and his collaborator (1992) conducted a more detailed and in-depth analysis of cultural values. The Schwartz Value Survey was compiled by conducting surveys on teacher samples from more than 20 countries. Since Schwartz (1992) used more representative samples, more comprehensive items, and more systematic data during the development of the scale Analytical methods, the Schwartz Value Survey has also been widely used (S. H. Schwartz, 1992).

Learn from and develop the theories of cultural dimensions and modernization theory, Schwartz posits seven a priori cultural value orientations that correspond to cultural ideals, which are shared conceptions of good and desirable cultural standards (S. Schwartz, 2006).

The seven cultural value orientations are (Figure 1):

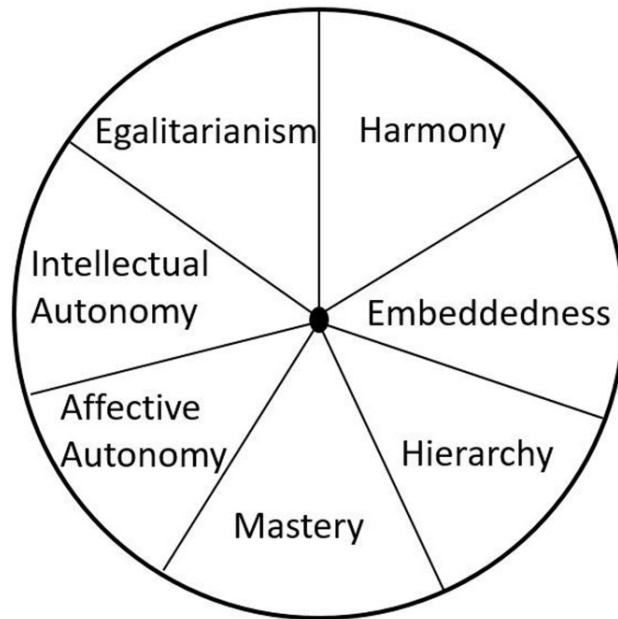


Figure 1 Schwartz's cultural value orientation model (S. Schwartz, 2006)

Embeddedness: This orientation reflects the importance of belonging to a larger group and following traditional norms and customs. This value is commonly found in collectivist cultures where harmony and maintaining social relationships are highly valued.

Hierarchy: This orientation reflects the importance of power and status in society. In cultures with a strong emphasis on hierarchy, people are expected to respect authority figures and maintain social order.

Mastery: This orientation reflects the importance of personal achievement and competence. Cultures with a strong emphasis on mastery value education, skill development, and individual accomplishments.

Egalitarianism: This orientation reflects the importance of equality, fairness, and justice in society. Cultures with a strong emphasis on egalitarianism reject hierarchies and value social justice and equal opportunities for all.

Harmony: This orientation reflects the importance of maintaining social harmony and avoiding conflict. Cultures with a strong emphasis on harmony value cooperation, compromise, and the avoidance of confrontation.

Affective Autonomy: This orientation reflects the importance of personal emotions and feelings. Cultures with a strong emphasis on affective autonomy value self-expression, emotional openness, and individual authenticity.

Intellectual Autonomy: This orientation reflects the importance of independent thinking and intellectual exploration. Cultures with a strong emphasis on intellectual autonomy value critical thinking, creativity, and intellectual curiosity.

Schwartz's Framework has been used in a variety of contexts, including cross-cultural research, organizational behavior, and consumer behavior. It provides a useful tool for understanding the values that motivate people and the conflicts that can arise when those values clash.

2.2.3 GLOBE Project

The GLOBE (Global Leadership and Organizational Behavior Effectiveness) research program was founded by Robert House in 1991. The GLOBE program has identified nine cultural dimensions that are relevant for leadership and organizational behavior effectiveness: performance orientation, assertiveness, future orientation, humane orientation, gender egalitarianism, institutional collectivism, in-group collectivism, power distance, and uncertainty avoidance (GLOBE 2004 study). Which is similar to the Hofstede culture dimension.

2.2.4 World Value Survey

The World Values Survey (www.worldvaluessurvey.org) is a large-scale, cross-national study that explores people's values and beliefs, as well as their attitudes towards different social and political issues. The survey was first conducted in 1981 and has since been carried out in more than 100 countries, making it one of the most extensive and diverse surveys of its kind. Ronald Inglehart and the WWSA Vice-President Christian Wenzel assert that there are two major dimensions of cross-cultural variation in the world: traditional values versus secular-rational values and survival values versus self-expression values

2.3 National Culture and Working Capital Management

There seem to be obvious differences in working capital management practices among different countries (Danske Bank & Ernst & Young, 2009; Koralun-Bereźnicka, 2014b; Sawers, 2012). Different countries have different distributions of Days Inventory Outstanding, Days Sales Outstanding, and Days Payables Outstanding.

As there are some differences in working capital management performance, it's important to consider whether cultural factors influence the corporation phenomenon (Wu, 2016).

The national culture is an informal institution that can explain various aspects of finance. A survey showed that national culture has a significant influence on financial decisions made by households and firms (Aggarwal et al., 2016). Many researchers paid attention to this area at a different level of evidence. Such as, at the individual level (Chui et al., 2010; Grinblatt & Keloharju, 2001; Guiso et al., 2008, 2013; Han et al., 2010; Siegel et al., 2011); at the firm level (Ahern et al., 2015; Giannetti & Yafeh, 2010; Li et al., 2013; Shao et al., 2010); at the national institutional level (Aggarwal & Goodell, 2009; Gorodnichenko & Roland, 2011; Kwok & Tadesse, 2006; Stulz & Williamson, 2003). Researchers focused on the impact of culture on executive compensation (Tosi & Greckhamer, 2004), debt ratio (Chui et al., 2002), dividend policies (Shao et al., 2010), earnings management (Han et al., 2010), debt maturity (Zheng et al., 2012), risk-taking (Li et al., 2013), mergers and acquisitions (Ahern et al., 2015), profit reinvestment (El Ghouli et al., 2016), corporate cash holding (Chen et al., 2015; Tran, 2020) and credit trade (El Ghouli & Zheng, 2016; Mättö & Niskanen, 2019).

However, the working capital management efficiency differences across countries and the impact of national culture are seldom explored.

Hofstede et al. (2010) defined culture as “the collective programming of mind”, which led to distinguishing “the members of one group or category of people from others” (G. H. Hofstede et al., 2010. p.06). Hofstede's cultural dimensions constitute an intellectual framework centred on intercultural communication. These dimensions describe the influence of deep-rooted culture on the values of members of their own society, explore the multi-dimensionality of culture, and provide a scoring system that can be used as a comparison of dimensions. Amount of works of literature has been

evidence of the influence of national culture on financial decision-making and the determinate factors of working capital management. But the area of the national culture related to working capital management is limited. Even the results of the research were conflicting (Katri & Tuuli, 2016). To get a deeper understanding of the relationship between national culture and working capital management, further research is needed. The remainder of the dissertation is going to examine if Hofstede's six cultural dimensions affect the length of the Cash Conversion Cycle and if the effects are different in different economic conditions.

2.3.1 Hofstede's Cultural Dimensions and WCM

Power Distance Index and WCM

Power distance refers to the social situation of unequal social status between people, which is a common phenomenon in various social groups. A company with a high PDI is a company with a strong sense of class. The employees at the grassroots level do not dare to express contrary opinions to the leaders. The leaders will deliberately build up psychological walls to make employees feel that the leaders are unattainable. Enterprises with low PDI have a low-class concept, and grassroots employees and leaders can communicate without barriers. The leadership will deliberately remove their halo so that employees can easily contact themselves. Previous literature has shown that banking sectors have a lower concentration in countries with greater power distance (Malul et al., 2009; Malul & Shoham, 2008). Zheng et al. (2012) proved the use of Long-term debt is negatively associated with power distance (Zheng et al., 2012).

In the view of WCM, the power distance between companies is dependent on their bargaining powers (Wu, 2016). In high power distance cultures, large firms have more negotiating power, which can be used to their own benefit (G. Hofstede, 1994). The powerful firm may collect money earlier from customers but pay their suppliers later. Boschker (2011) got conclusion that SMEs with high PDI from countries have a long CCC, which means WCM is less efficient (Boschker, 2011). This is the same as the result of Wu (2016), confirming that working capital management and PDI have a positive relationship (Wu, 2016). Therefore, the hypothesis is suggested as follows:

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

Individualism and WCM

Individualism, short for Individualism vs Collectivism, refers to the degree of the people in society are integrated into groups. Several studies have shown that individualism is related to financial decision-making. Banking sectors are less concentrated in more individualistic countries (Malul et al., 2009; Malul & Shoham, 2008). Individualism is also positively associated with firm performance and effective management practices (Newman & Nollen, 1996). It is expected that Individualism is positively associated with accounts payable and negatively associated with accounts receivable, as efficient financial management leads to lower accounts receivable and higher accounts payable. International diversification is positively associated with individualism, societies with high levels of individualism invest more in foreign equity (Beugelsdijk & Frijns, 2010). Zheng et al. (2012) proved the use of Long-term debt is negatively associated with individualism determinants of working capital management, evidence from Malaysia (Zheng et al., 2012). Li et al. (2013) evident individualism has a significant and positive relation with firm-level risk-taking (Li et al., 2013). Chen et al. (2015) showed that individualism is negatively correlated with firm cash holdings because when managers have more confidence in their financial situation, will underestimate the demand for cash. Also, evidence that individualism is positively related to the firm's capital expenditures, acquisitions, and repurchases (Chen et al., 2015). Malul & Shoham (2012) found that the society becomes more collectiveness, the savings level will increase (Shoham & Malul, 2012).

In the view of WCM, Boschker (2011) got the result that IDV has a negative influence on the length of the CCC, but the influence is slightly insignificant (Boschker, 2011). Wu (2016) and Katri & Tuuli (2016) got a negative relationship between individualism and the length of the CCC (Katri & Tuuli, 2016; Wu, 2016). The following hypothesis is suggested:

Hypothesis 2: There is a negative relationship between individualism and the length of the cash conversion cycle.

Uncertainty Avoidance Index and WCM

Uncertainty avoidance is defined as “the extent to which the members of a culture feel threatened by uncertain or unknown situations” (G. Hofstede, 2001, p161). Cultures prefer clear rules of conduct in high uncertainty avoidance while enjoying novel events and value differences when uncertainty avoidance is low (Griffin et al., 2009). International diversification is negatively associated with uncertainty avoidance, societies with higher levels of uncertainty avoidance invest less in foreign equity (Li et al., 2013). Uncertainty avoidance also has an impact on transaction costs of market and market versus bank financing, suggesting that the countries with greater uncertainty avoidance are more bank-based (Aggarwal & Goodell, 2009). Zheng et al. (2012) proved the use of Long-term debt is negatively associated with uncertainty avoidance (Zheng et al., 2012). The higher level of uncertainty avoidance is, the higher the level of national saving will be (Shoham & Malul, 2012). Li et al. (2013) discovered uncertainty avoidance is associated with firm-level risk-taking negatively (Li et al., 2013). Chen et al. (2015) found that uncertainty avoidance has a positive relationship between uncertainty avoidance and firm cash holdings, and it is negatively related to the firm’s capital expenditures, acquisitions, and repurchases (Chen et al., 2015).

In the view of WCM, exist different views on uncertainty avoidance. Boschker (2011), Katri & Tuuli (2016) came to the same conclusion, that uncertainty avoidance has a positive relationship with the length of CCC (Boschker, 2011; Katri & Tuuli, 2016). Wu (2016) came out with one opposite conclusion. To establish the research question, the following hypothesis is suggested:

Hypothesis 3: There is a relationship between high uncertainty avoidance and the length of the cash conversion cycle.

Masculinity and WCM

Masculinity is short for Masculinity vs femininity, which refers to the degree of preference of members of society for "decisiveness and material success" or "sensibility and interpersonal relationships". Jianakoplos & Bernasek (1998) believe that there are differences between genders when it comes to financial risk-taking (Jianakoplos & Bernasek, 1998). A generally accepted view is that women have a lower risk tolerance than men. Anderson et al. (2011) document that institutional investors from countries with a high level of masculinity have a high level of foreign diversification for

portfolios (Anderson et al., 2011). Zheng et al. (2012) evident the use of Long-term debt is negatively associated with masculinity (Zheng et al., 2012). In Slovakia, through questionnaire survey among the samples of managers found that managers tend to favor feminized work style culture (Daňková & Droppa, 2015).

In the view of WCM, Wu (2016) is in the same line with Katri & Tuuli (2016) that masculinity is negatively related to the length of CCC (Katri & Tuuli, 2016; Wu, 2016). On the contrary, Boschker (2011) got a positive correlation between masculinity and the length of CCC (Boschker, 2011). So, the following hypothesis is suggested:

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

Long-term Orientation and WCM

The dimensions of long-term and short-term orientation refer to the degree to which members of a culture accept delaying the satisfaction of their material, emotional, and social needs. This dimension shows the extent to which moral life is worth pursuing without requiring any religion to justify it. In the research of Lumpkin et al. (2010), LTO is defined as the “tendency to prioritize the long-range implications and impact of decisions and actions that come to fruition after an extended time period”(Lumpkin et al., 2010, p241). Focusing on the future is a key attribute of LTO both intuitively and practically (Brigham et al., 2013). Anderson et al. (2011) evidence that investors have less home bias from countries with a high level of masculinity and long-term orientation (Anderson et al., 2011). In Slovakia, through questionnaire survey among the samples of managers found that managers tend to a culture of long-term orientation (Daňková & Droppa, 2015).

In the view of WCM, the conclusion of Boschker (2011) and Katri & Tuuli (2016) are similar that there is no significant relationship between the long-term vs short-term orientation dimension and the length of CCC. In Wu’s (2016) research, this dimension was not mentioned. Considering all the previous reaches, the following hypothesis is suggested:

Hypothesis 5: There is a relationship between long-term orientation and the length of the cash conversion cycle.

Indulgence and WCM

Indulgence short for indulgence and restraint, refers to the degree to which a society allows people's basic needs and desires to enjoy life and enjoyment. Which is a newly developed dimension of Hofstede's cultural dimensions. In a society that practices indulgence, making room for relatively free natural satisfaction and human drive, these indulgences involve indulging in fun and the enjoyment of life. The nature of restraint describes a society that inhibits the satisfaction of needs and attempts to control them through strict social norms.

In the view of WCM, there is an insignificant relationship between the indulgence vs restraint dimension and the length of CCC (Katri & Tuuli, 2016). The dimension still lacks research on the finance area. To test whether exist relationship between them, the following hypothesis is suggested:

Hypothesis 6: There is a relationship between indulgence and the length of the cash conversion cycle.

2.3.2 Performance in Different Economic Conditions

All the hypotheses mentioned above were in the same implied strong hypothesis, which is that each national culture dimension has one changeless impact on WCM within different economic conditions. A strong external factor must be considered because there might be different performances of national culture within different periods. For example, the power distance influence on WCM by the impact of bargaining powers. In the condition of the pandemic, bargaining power is probably out of managers' control.

The following hypothesis is suggested:

Hypothesis 7: There are different performances of national culture dimensions on the length of the cash conversion cycle with different economic conditions.

2.3.3 Summary of the Hypotheses

In this part, all the hypotheses are presented in the table 1. Including dependent variables, independent variables that will be used in panel data regression, and the expected relation between them.

Table 1 Summary of the Hypothesis

Hypothesis	Cultural Dimension	Working Capital Measure	Expected Relationship
H1	Power Distance	CCC	Positive
H2	Individualism	CCC	Negative
H3	Uncertain. Avoidance	CCC	Positive/Negative
H4	Masculinity	CCC	Positive/Negative
H5	Long Term Orientation	CCC	Positive/Negative
H6	Indulgence	CCC	Positive/Negative
H7	6 National Culture Dimensions	CCC	Different performance between economic conditions

This table presents the summary of all the 7 hypotheses. From row 1 to row 6 are the expected relationships in individually perspective from Hofstede's national culture dimensions to CCC individually. Row 7 is the expected relationship in a combine perspective.

Although national differences are generally recognized, the research trying to explain the connection between the countries' differences and working capital efficiency is limited, especially, the research about if the relationship between the national cultural and short-term financial management in different periods will be changed.

3. Research Design

3.1 Data Collection

The sample variables that have been chosen are included both country-level variables and firm-level financial variables that affect working capital management. The firm-level financial data, to calculate the required parameters are retrieved from the Thomson Worldscope database for analysis. The financial variables include net income, depreciation, total assets, total liabilities, net sales, fixed assets, current assets, current liabilities, inventories, accounts receivable, and accounts payable. Use Global Industry Classification Standard (GICS) classification system to identify companies' industry membership and all public and private companies are chosen, followed Beuselinck et al. (2007) and Wu (2016) excluded companies in the financial and utility industries, which could distort the analysis (Beuselinck et al., 2007; Wu, 2016).

At the start, 71 countries were selected from Hofstede's insights. This study excluded countries with incomplete information on six dimensions was excluded and 51 countries left. Selected all eligible companies in these 51 countries from the database. As Saunders et al. (2009) present the data should be checked for missing values and errors (Saunders et al., 2009). This study removed all the companies that lack data to deal with the missing point. To minimize the impact of outlier value, 10 to 90-percentile outliers were eliminated. And manually remove the countries whose sample value is less than 10. The final sample consists of a balanced panel of 3851 company observations from 26 countries during 2007-2021.

The country-level financial variable, economic growth, was acquired from the World Bank.

To define the economic cycle, the website National Bureau of Economic Research (2023), Business cycle clock (2023), and Macromicro (2023) are used to check the business cycle. And because of external sources limitations, only 18 countries' business cycles are defined.

In the requirement of observing the performance of one national culture on WCM in different economic conditions, the most recent worldwide business cycle including

the period of international covid, a total 15 years of period (2007~2021) was chosen to collect data.

3.2 Chosen Variables

3.2.1 Dependent Variables-Cash Conversion Cycle

The effectiveness of working capital management can be measured using the Cash Conversion Cycle (CCC). CCC is an important metric for a business to determine how efficiently a company can convert its inventory into sales and cash (Baños-Caballero et al., 2010, 2014; Gitman, 1974). For comparability and replication purposes, the cash conversion cycle is used as the dependent variable to measure the working capital management as the same in the previous studies (Boschker, 2011; Katri & Tuuli, 2016; Wu, 2016). In Figure 2, CCC is explained intuitively.

The calculation of CCC is defined the same as Deloof (2003), as follows:

$$\text{CCC} = \text{Number of days accounts receivable} + \text{Number of days inventory} - \text{Number of days accounts payable (Deloof, 2003,p.576)}$$

Number of days accounts receivable= (accounts receivable×365)/sales

Number of days inventory = (inventories×365)/cost of sales

Number of days accounts payable = (account payable×365)/purchases

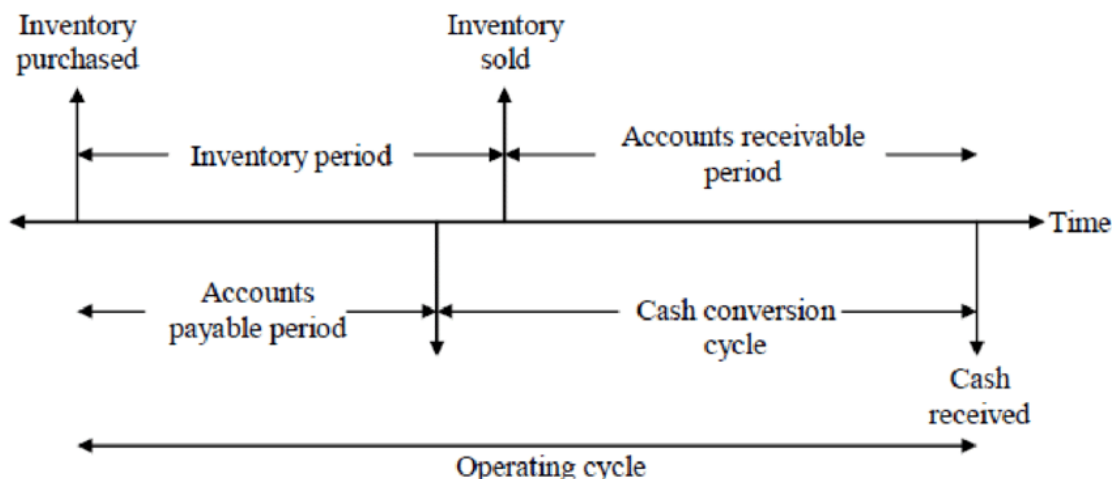


Figure 2 The cash conversion cycle

3.2.2 Independent Variables -National Cultural Dimension

The national cultural dimensions presented as explanatory variables in this study are Hofstede's Cultural dimensions followed by the previous researchers (Boschker, 2011; Katri & Tuuli, 2016; Wu, 2016). Hofstede's Cultural Framework included Power Distance, Uncertainty Avoidance, Individualism versus Collectivism, Masculinity versus Femininity, Long versus Short term orientation, and Indulgence versus Restraint six dimensions. The data for each country about six cultural dimensions came from the official website. Since the change of culture can't be identified over time (Sivakumar & Nakata, 2001), some other national culture frameworks were chosen to control for the robustness test.

3.2.3 Control Variables

For comparability and replication purposes, the same control variables as Katri&Tuuli (2016) are chosen. Control variables are as follows: cash flow, growth opportunity, leverage, quick ratio, fixed to total assets, firm size, and economic growth. All the control variables chosen are based on previous research that has an impact on working capital management (WCM).

Cash Flow

The cash flow is used to finance the operational business. Afrifa & Tingbani (2018) suggested that managers should pay attention to the economic implications of the cash flow available on investment in working capital (Afrifa & Tingbani, 2018). Cash flow is calculated as the ratio of net income plus depreciation to total assets. Baños-Caballero et al.(2010) found that firms with greater cash flows have a longer CCC (Baños-Caballero et al., 2010) , but Chiou et al. (2006) presented contradicting results that companies with higher operational cash flow will have more efficient working capital management (Chiou et al., 2006). To date, empirical evidence offers different indications, and the research results on the impact that cash flow on working capital is not clear.

As general, cash flow is computed as:

$$\text{Cash Flow} = (\text{Net income} + \text{Depreciation}) / \text{Total assets}$$

Debt Ratio

There is a significant relationship between leverage and working capital management, as the level of leverage a company uses can impact its working capital needs and management strategies. The debt ratio is evaluated as total liabilities to total assets. The previous study stated a negative relationship with CCC (Baños-Caballero et al., 2010). Companies with higher debt levels have high financial risk and need more cash flows from operations in order to repay debt or renew it which will shorten the CCC (Nwankwo & Osho, 2010; Tesfay & Batra, 2018). Indeed, empirical evidence suggests that working capital management measures decrease when firms increase leverage (Chiou et al., 2006). Therefore, it is possible to anticipate a negative relationship between the Debt ratio and CCC.

Debt ratio is computed as:

$$\text{Debt Ratio} = \text{Total liabilities} / \text{Total assets}$$

Growth Opportunities

A growth opportunity is a chance for a company to expand its business and increase its revenue and profitability. Various empirical studies have shown that growth opportunities could also affect the firm's working capital management (Baños-Caballero et al., 2010; Hill et al., 2010; Kieschnick et al., 2006). Kieschnick et al. (2006) show that the higher the growth opportunity is, the longer CCC will be (Kieschnick et al., 2006). Growth opportunities can impact a company's cash conversion cycle in several ways. For example, expanding into new markets or introducing new products may require additional investments in inventory, which can increase the CCC. However, Hill et al. (2010), and Baños-Caballero et al. (2010) found a negative relationship between growth opportunity and CCC. Growth opportunities can lead to increased sales and faster collection of accounts receivable, which can decrease the CCC. Therefore, since these opposite conclusions on the expected effect of growth opportunity on investment in working capital, the expected relationship is not clear. The rate of growth opportunity of a company is measured by the change in its annual sales.

Growth Opportunity is computed as:

$$\text{Growth Opportunity} = (\text{Net sales}_t - \text{Net sales}_{t-1}) / \text{Net sales}_{t-1}$$

Quick Ratio

The quick ratio is a financial metric used to evaluate a company's liquidity and ability to meet short-term financial obligations. It measures a company's ability to pay its current liabilities using its most liquid assets. A higher quick ratio is generally considered more favorable, as it indicates a company has a strong ability to meet its short-term obligations.

A company with a longer cash conversion cycle needs to reserve more cash and short-term investment for their operation which creates a higher quick ratio (Moss & Stine, 1993). Rimo & Panbunyuen (2010) rejected the hypothesis that quick ratio is positively related to CCC (Rimo & Panbunyuen, 2010).

Quick Ratio is computed as:

$$\text{Quick Ratio} = (\text{Current Assets}-\text{Inventories})/\text{Current liabilities}$$

Firm Size

Firm size as a control variable is often associated with financial constraints. Chen et al. (2015) indicate that firm cash holdings decreased with the firm's size (Chen et al., 2015). Kieschnich et al. (2006) and Chiou et al. (2006) showed a positive relationship between firm size and the length of CCC (Chiou et al., 2006; Kieschnich et al., 2006). Generally speaking, larger firms tend to have more complex operations and greater financial resources than smaller firms. Larger firms may also have more bargaining power with suppliers and customers, which can lead to more favorable payment terms and better management of cash flow. Smaller firms may face more challenges in managing their working capital due to limited financial resources, lack of bargaining power with suppliers and customers, and less sophisticated financial management systems.

Firm size is computed as the natural logarithm of total assets, as used by earlier research (Deloof, 2003; Rimo & Panbunyuen, 2010).

Fixed to Total Asset

The previous empirical evidence shows that another factor that could affect the firm's working capital management is invested in fixed assets. Kieschnich et al. (2006)

showed that fixed assets are negatively correlated with the length of CCC, and when a firm is financially constrained, fixed investment competes with working capital levels for funding (Kieschnick et al., 2006). Firms with higher fixed assets are more active in their working capital management (Baños-Caballero et al., 2010). The following research, Wu (2016) is standing in line with this conclusion.

Fixed to total assets is computed as:

$$\text{Fixed to total assets} = \text{Fixed assets} / \text{Total assets}$$

Economic Growth

Given the long-time span and cross-country of our samples, which simultaneously include period of economic recession, period of economic expansion, periods of Covid, and periods of pre-covid, different economic conditions may affect the WCM. In this case, our result could be driven by macroeconomic conditions (Molina & Preve, 2009). Followed by Pinkowitz et al. (2006) this study uses GDP growth as a country-level control variable to test if economic development will affect WCM (Pinkowitz et al., 2006).

3.2.4 Economic Condition Definition

Building on earlier research on the relationship of national culture with short-term finances, several variables were chosen to approach the panel data model of working capital management.

To identify the conditions of different performances of national culture in WCM, according to the GDP growth (annual%) from The WORLD BANK, and economic cycle from the Macromicro:

1. A year for one specific country in which most of the months are in expansion and recovery is defined as a year of economic expansion.
2. A year for one specific country in which most of the months are in recession and slowdown is defined as a year of economic recession.
3. The year 2020-2021, is defined as a period of international Covid.
4. The years before 2020, is defined as a period of Pre-covid.

3.3 Estimation

3.3.1 Regression Model

To examine the relationship between national culture and working capital management, this study uses quantitative data analysis to do research. The Stata 17 statistics program is used for regression. Following the previous methodology (Chen et al., 2015; Wu, 2016), and adjusting the model to make the model more suitable for research needs, our empirical specifications build on the following model:

Model 1:

$$CCC_{i,t} = \beta_0 + \beta_1 PDI_t + \beta_2 IDV_t + \beta_3 MAS_t + \beta_4 UAI_t + \beta_5 LTO_t + \beta_6 IVR_t + \sum \beta_n Controls_{i,t} + \varepsilon_{i,t}$$

Where i and t denote firm and year, and ε is the error term. The dependent variable is Cash Conversion Cycle (CCC), β_0 refers to the intercept, also known as the study constant, and the independent variables are Hofstede's six culture dimensions: power distance (PDI), individualism (IDV), masculinity (MAS), and uncertainty avoidance (UAI), long-term orientation (LTO) and Indulgences (IVR). $Controls_{i,t}$ refers to the control variables: economic growth (EG), cash flow (CF), debt ratio (DR), growth opportunity (GO), firm size (FS), fixed to total assets (FTA) and quick ratio (QR).

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 (Chen et al., 2015; Wu, 2016).

3.3.2 Regression Model for Comparing Different Economic Conditions

To examine whether each national culture has a significant difference in performance between economic conditions, two pooled effect models with different dummies were generated to analyse the result.

Model 2 is used to analyse the different performances of national culture dimension between economic conditions of expansion and recession, presented as follows:

Model 2:

$$\begin{aligned}
CCC_{i,t} = & \beta_0 + \beta_{1,E}PDI-E_i + \beta_{1,R}PDI-R_i + \beta_{2,E}IDV-E_i + \beta_{2,R}IDV-R_i + \beta_{3,E}MAS-E_i + \\
& \beta_{3,R}MAS-R_i + \beta_{4,E}UAI-E_i + \beta_{4,R}UAI-R_i + \beta_{5,E}LTO-E_i + \beta_{5,R}LTO-R_i + \beta_{6,E}IVR-E_i + \\
& \beta_{6,R}IVR-R_i + \Sigma \beta_n Controls_{i,t} + \varepsilon_{i,t}
\end{aligned}$$

Where i and t denote firm and year, E denotes the dummy variable for the economic condition of expansion. R denotes the dummy variable for the economic condition of recession. The dependent variable is $CCC_{i,t}$. β_0 refer to the intercept. $\beta_{1,E}$, $\beta_{2,E}$, $\beta_{3,E}$, $\beta_{4,E}$, $\beta_{5,E}$, $\beta_{6,E}$ refer to the correlations of national culture dimension with the economic condition of expansion. $\beta_{1,R}$, $\beta_{2,R}$, $\beta_{3,R}$, $\beta_{4,R}$, $\beta_{5,R}$, $\beta_{6,R}$ refer to the correlations of national culture dimension with the economic condition of recession. Independent variables are 12 interaction terms (6 national culture dimensions time two dummy variables): power distance (PDI-E, PDI-R), individualism (IDV-E, IDV-R), masculinity (MAS-E, MAS-R), uncertainty avoidance (UAI-E, UAI-R), long-term orientation (LTO-E, LTO-R), and Indulgences (IVR-E, IVR-R). Control variables refer to: economic growth (EG), cash flow (CF), debt ratio (DR), growth opportunity (GO), firm size (FS), fixed-to-total assets (FTA), and quick ratio (QR).

Model 3 is used to analyses the different performances of national culture dimensions between economic conditions of Pre-covid and Covid, presented as follow:

Model 3:

$$\begin{aligned}
CCC_{i,t} = & \beta_0 + \beta_{1,P}PDI-P_i + \beta_{1,C}PDI-C_i + \beta_{2,P}IDV-P_i + \beta_{2,C}IDV-C_i + \beta_{3,P}MAS-P_i + \\
& \beta_{3,C}MAS-C_i + \beta_{4,P}UAI-P_i + \beta_{4,C}UAI-C_i + \beta_{5,P}LTO-P_i + \beta_{5,C}LTO-C_i + \beta_{6,P}IVR-P_i + \\
& \beta_{6,C}IVR-C_i + \Sigma \beta_n Controls_{i,t} + \varepsilon_{i,t}
\end{aligned}$$

Where i and t denote firm and year, P denotes the dummy variable for the economic condition of Pre-covid. C denotes the dummy variable for the economic condition of Covid. The dependent variable is $CCC_{i,t}$. β_0 refer to the intercept. $\beta_{1,P}$, $\beta_{2,P}$, $\beta_{3,P}$, $\beta_{4,P}$, $\beta_{5,P}$, $\beta_{6,P}$ refer to the correlations of national culture dimension with the economic condition of Pre-covid. $\beta_{1,C}$, $\beta_{2,C}$, $\beta_{3,C}$, $\beta_{4,C}$, $\beta_{5,C}$, $\beta_{6,C}$ refer to the correlations of national culture dimension with the economic condition of Covid. Independent variables are 12 interaction terms (6 national culture dimensions time two time dummy variables): power distance (PDI-P, PDI-C), individualism (IDV-P, IDV-C), masculinity (MAS-P, MAS-C), uncertainty avoidance (UAI-P, UAI-C), long-term orientation (LTO-P, LTO-C), and Indulgences (IVR-P, IVR-C). Control variables refer to:

economic growth (EG), cash flow (CF), debt ratio (DR), growth opportunity (GO), firm size (FS), fixed-to-total assets (FTA), and quick ratio (QR).

3.3 Sample Description

3.3.1 Samples Original

Descriptive Statistics for chosen variables are presented in Appendix 1. The CCC and control variables are presented with the mean value of 15 years within each country.

The descriptive statistics show that the shortest CCC is in South Africa, with an average value of 50.15 days, and the longest CCC is in Singapore, with an average value is 124.53 days. The overall mean of CCC from 26 countries is 79.45 days.

Country-level mean for the control variables is also shown in Appendix 1. The range of economic growth (EG) is from -0.02 (Italy) to 0.08 (China). The lowest cash flow (CF) is 0.10 from Italy to the highest is 0.36 from Thailand. Italy has the highest debt ratio (DR) of 0.66, while the lowest DR is 0.35 from Hong Kong. The range of growth opportunities (GO) is from 0.02 in Japan to 0.31 in China. The firm size (FS) mean value largest is 9.46 in Japan, whereas the smallest firm by average is located in Thailand with a mean value of 8.14. The mean value of the ratio of fixed assets to total assets is from 0.28 in Sweden to 0.55 in Peru. The quick ratio (QR) ranges from 1 in Denmark to 2.04 in the United States of America.

3.3.2 Panel Data Descriptive Statistics

Descriptive Statistics for panel data are presented in Appendix 2. The total number of samples is 390, with 26 countries in 15 years. Since the quantity of cases (26) is much bigger than the quantity of period (15), the unit root test is not suitable for testing the consistency of variables. All sample mean, standard deviation, maximum, and minimum are summed up. All the sample mean of CCC is 79.45, the minimum is 41.28, maximum is 143.46. The maximum and minimum values differ by more than three times.

3.3.3 Normal Distribution Test

A histogram (Appendix 3) of CCC was generated to show the reliability of data collection. The total distribution of CCC is the most similar to normal distribution compared with other data collection condition combinations.

To test the normality of residuals, the Q-Q plot of the residuals is a visual test of normality (Appendix 4). It clearly shows that which illustrates a slight violation of normality of residuals assumptions. Considering that few phenomena in the world obey pure normal distribution, this result does not prevent this study from testing Pooled OLS regression.

3.3.4 Heteroskedasticity and Linearity

For Pooled OLS, homogenous variance is ideal. In the data set of this study (Appendix 5), no obvious clustering of data points is found. These pictures show that residuals illustrate homoscedasticity visually.

Also, six linearity graphs were generated to test if exist linearity between national culture dimensions and CCC (Appendix 6).

Results conclude clearly that the data could be analyzed with Pooled OLS Regression model.

3.3.5 Pearson Correlation Matrix

In order to measure the degree of the linear relationship among culture dimensions, control variables, and CCC, this study calculates Pearson's Correlation Coefficient to see the relationship between all variables (Tabachnick & Fidell, 2007). Based on Appendix 7, the correlation between CCC and IDV, MAS, UAI, IVR, DR, and FS at a negatively significant level, and the correlation between CCC and PDI, LTO, EG, GO, and QR at a positively significant level. Exploring the variables individually showed some correlation between them. Meanwhile, the correlation coefficients shown in the table indicate that there are some multiline relationships between IDV, IVR, PDI, and CCC, but the coefficient of them showed that the multilinear relationship is not a big problem in this model. As the correlation matrix table showed, CF and FTA had no significant correlation with CCC.

4. Results

4.1 Baseline Result

The baseline of this research used Pooled OLS Regression model including 6 firm-level control variables, 1 country-level control variable, and 6 national culture dimension variables. Results are presented in Table 2:

Table 2 Effect of National Culture Dimensions on CCC

	1	2	3	4
Dependent Variables(t)	CCC	CCC	CCC	CCC
Period	2007~2021	2007~2021	2007~2021	2007~2021
National Culture Dimensions				
PDI		0.429***		
IDV			-0.535***	
MAS				-0.249***
UAI				
LTO				
IVR				
Control Variables(t-1)				
EG	112.909***	47.123	7.017	112.683***
CF	-38.494***	-11.577	-24.766***	-53.464***
DR	-17.435*	-19.058**	-13.172*	-17.987**
GO	-2.486	-6.983	0.111	3.922
FS	-16.084***	-10.376***	-7.616***	-16.410***
FTA	-35.983**	-66.074***	-128.684***	-39.470***
QR	31.920***	24.509***	17.516***	35.298***
_cons	206.485***	154.369***	217.652***	221.630***
Countries	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes
Adjusted R²	0.340	0.422	0.594	0.395
N	364	364	364	364

This table presents the baseline results, starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 to 7). Finally (column 8), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.

Table 2 (Continued): Effect of National Culture Dimensions on CCC

	5	6	7	8
Dependent Variables(t)	CCC	CCC	CCC	CCC
Period	2007~2021	2007~2021	2007~2021	2007~2021
National Culture Dimensions				
PDI				0.159**
IDV				-0.562***
MAS				-0.046
UAI	-0.222***			-0.264***
LTO		0.358***		0.160***
IVR			-0.175***	0.368***
Control Variables(t-1)				
EG	111.763***	60.589*	99.076***	-18.350
CF	-56.423***	-4.387	-23.746**	-54.022***
DR	-7.098	-24.888***	-18.726**	-1.980
GO	-1.284	-9.178	-7.885	9.578
FS	-16.258***	-15.977***	-13.234***	-11.299***
FTA	-4.080	-7.785	-41.004***	-84.062***
QR	30.213***	22.421***	29.655***	13.166***
_cons	208.638***	185.230***	194.015***	221.030***
Countries	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes
Adjusted R²	0.387	0.437	0.354	0.713
N	364	364	364	364

This table presents the baseline results, starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 to 7). Finally (column 8), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.

In the start, only control variables were used to establish the regression model. Next, the national culture dimension variables were one by one individually added into the model. In the end, all the national culture dimension variables were added to the model simultaneously to observe the effect of national culture on CCC.

The results presented confirm a strong relationship between WCM and national culture. For conducting the regression with full samples from the year 2007 to 2021, The model adjusted R-squared is 0.713, and variables are explained 71.3% variation in CCC.

For control variables, the regression results showed that CF, FS, FTA, and QR are significant at a level of 1%. CF, FS, and FTA are negatively significant with CCC, which the result is consistent with Wu (2016), while QR is positively significant with CCC.

Hypothesis 1, which suggested that PDI has a positive relationship with the length of CCC, is supported. In a country with higher PDI, companies have a higher propensity to bargain, extending days of accounts payable and days of inventory. PDI thus had a significant positive effect on CCC length.

Hypothesis 2, which suggested IDV has a negative relationship with the length of CCC, is supported. In a country with higher IDV, managers have a lower need for cash holdings, which will lead to short days of accounts payable. Thereby IDV has a significant negative impact on CCC length.

Hypothesis 3, which suggested that UAI has a relationship with the length of CCC, is supported. In a country with higher UAI, managers will try to reduce the number of days inventory and improve corporate profitability in order to avoid uncertainty. Thereby UAI has a significant negative impact on the length of CCC.

Hypothesis 4, which suggested that there is a relationship between MAS and the length of CCC, is not supported. In the individual test, MAS showed a significant negative correlation with CCC at the 1% level. In a country with high MAS, a higher proportion of male managers is willing to take higher financial risks, lower cash holdings, and lower days of accounts receivables. However, in the combine test, it did not show significance. From the Pearson coefficient matrix, it can be observed that MAS is significantly correlated with some of the remaining cultural dimensions. This may be the reason why the final regression results are not significant.

Hypothesis 5, which suggested that there is a relationship between LTO and the length of CCC, is supported. In a country with a higher LTO, the degree to which cultural members receive delayed satisfaction of their material needs is higher. By this time, the number of days inventory of enterprises will increase, which will have a significantly positive impact on the length of CCC.

Hypothesis 6, which suggested that there is a relationship between IVR and the length of CCC, is supported. In the individual test, IVR showed a significant negative effect on CCC length. In a country with a higher dimension of IVR, cultural members

are more inclined to satisfy their own desires and needs. The number of days inventory of the enterprise is thus relatively lower. Thus IVR has a significant negative impact on CCC length. But IVR showed a significant positive effect in the combined tests. From the Pearson coefficient matrix, it can be observed that IVR is significantly highly correlated with some cultural dimensions, which may be the reason to cause two different signs to be detected.

4.2 Additional Test

4.2.1 Economic Expansion VS Economic Recession

To compare the differences between the economic expansion period and the economic recession period, the Pooled OLS model with dummy variables is used. The results summary are presented in Table 3.

Based on the results, PDI has a significantly positive relationship with CCC in condition of economic recession, while no significant relationship was found in condition of economic expansion. IDV, UAI, and IVR are significant at 1% level in both the economic expansion and the recession condition. LTO is significant at 10% level in the condition of economic expansion and significant at 5% level in the condition of economic recession. On the contrary, for MAS, no significant relationship was found in both conditions.

For PDI, is only significant in the condition of economic recession. Companies in a period of economic recession have a higher bargaining tendency due to lack of cash flow compared with a period of economic expansion.

Comparing the absolute value of the coefficient, IDV and IVR have a bigger impact on CCC in the condition of economic expansion.

IDV affects CCC by affecting managers' expectations of cash holdings. During the period of economic expansion, managers expect lower cash holdings. The managers' expectation increases during the period of economic recession. Managers are more cautious about the expectation of cash holdings in the condition of economic recession. Therefore, IDV has a smaller impact on CCC during economic recession than during economic expansion.

Table 3 Effect of national culture dimension on CCC (in the condition of economic expansion and economic recession)

	1	2	3	4
Dependent Variables(t)	CCC	CCC	CCC	CCC
Period	2007~2021	2007~2021	2007~2021	2007~2021
Dummy				
Expansion	No	Yes	Yes	Yes
Recession	No	Yes	Yes	Yes
Interaction Effect				
PDI*E		0.331***		
PDI*R		0.267***		
IDV*E			-0.566***	
IDV*R			-0.521***	
MAS*E				-0.061
MAS*R				-0.053
UAI*E				
UAI*R				
LTO*E				
LTO*R				
IVR*E				
IVR*R				
Control Variables(t-1)				
EG	112.909***	-24.875	-58.558*	31.835
CF	-38.494***	62.306***	35.122***	24.789
DR	-17.435*	-37.605***	-25.163***	-44.457***
GO	-2.486	6.488	5.836	13.870
FS	-16.084***	3.032	0.682	-0.664
FTA	-35.983**	18.049	-74.502***	49.371**
QR	31.920***	10.891***	12.060***	15.154***
_cons	206.485***	25.348	125.319***	64.697*
Countries	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes
Adjusted R²	0.3401	0.3232	0.5202	0.2783
N	364	238	238	238

This table presents the economic state condition test results (economic expansion and economic recession), starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 to 7). Finally (column 8), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.

Table 3 (Continued): Effect of national culture dimension on CCC (in condition of economic expansion and economic recession)

	5	6	7	8
Dependent Variables(t)	CCC	CCC	CCC	CCC
Period	2007~2021	2007~2021	2007~2021	2007~2021
Dummy				
Expansion	Yes	Yes	Yes	Yes
Recession	Yes	Yes	Yes	Yes
Interaction Effect				
PDI*E				0.182
PDI*R				0.229**
IDV*E				-0.600***
IDV*R				-0.551***
MAS*E				0.039
MAS*R				0.055
UAI*E	-0.219***			-0.292***
UAI*R	-0.256***			-0.354***
LTO*E		0.462***		0.150*
LTO*R		0.431***		0.168**
IVR*E			-0.116	0.454***
IVR*R			0.012	0.442***
Control Variables(t-1)				
EG	9.901	-47.036	18.927	-87.450***
CF	-2.324	72.964***	40.693**	-27.368*
DR	-36.179***	-43.804***	-42.808***	-15.640*
GO	14.266	3.470	11.371	11.092
FS	-3.703	-9.033**	0.334	-9.081***
FTA	66.224***	56.960***	46.014**	-42.877**
QR	16.058***	10.643***	13.194***	12.007***
_cons	98.553***	107.047***	53.058	184.474***
Countries	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes
Adjusted R²	0.3366	0.4212	0.2792	0.6776
N	238	238	238	238

This table presents the economic state condition test results (economic expansion and economic recession), starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 to 7). Finally (column 8), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.

IVR affects the length of CCC through the number of days inventory. The desire of members of a culture to satisfy their own needs is suppressed during economic recession compared with economic expansion. And desires expand during economic expansions. So IVR has a greater impact during periods of economic expansion.

UAI and LTO have a bigger impact on the length of CCC in the condition of economic recession than economic expansion.

UAI also affects the length of CCC by affecting the number of days inventory. In the period of economic expansion, managers can accept higher inventory risks. In the period of economic recession, in order to cope with financial constraints, managers will try to shorten the number of days inventory. So UAI in the economic recession periods has a greater impact than in the period of economic expansion.

During the period of economic recession, the shopping desire of cultural members is suppressed, which increases the number of days inventory of the enterprise. During the period of economic expansion, the desire is released, and the number of days inventory is shortened. Therefore, LTO has a greater impact during the period of economic recession than during the period of economic expansion.

4.2.2 International Covid VS Pre-covid

To compare the difference between the Pre-covid period and the international Covid period, the Pool OLS regression with time dummy variables were used. The correlation results summary is presented in Table 4.

Based on the results, PDI and IVR have significant statistical meaning in the condition of Pre-covid and no significant relationship was found in the condition of International Covid.

During the period of Covid, the economic activities of enterprises were strictly controlled and lost their bargaining power. As a result, PDI was not significant during the Covid period.

During the period of Covid, most countries only guarantee the most basic living needs. The inventory changes caused by desire and demand are not obvious. As a result, IVR is not significant during the period of Covid.

Table 4 Effect of national culture dimension on CCC (in condition of International Covid and Pre-covid)

	1	2	3	4
Dependent Variables(t)	CCC	CCC	CCC	CCC
Period	2007~2021	2007~2021	2007~2021	2007~2021
Dummy				
Dummy1(Covid)	No	Yes	Yes	Yes
Dummy2(Pre-covid)	No	Yes	Yes	Yes
Interaction Effect				
PDI*Dummy1		0.417***		
PDI*Dummy2		0.429***		
IDV*Dummy1			-0.504***	
IDV*Dummy2			-0.543***	
MAS*Dummy1				-0.164*
MAS*Dummy2				-0.273***
UAI*Dummy1				
UAI*Dummy2				
LTO*Dummy1				
LTO*Dummy2				
IVR*Dummy1				
IVR*Dummy2				
Control Variables(t-1)				
EG	112.909***	49.527	8.043	115.729***
CF	-38.494***	-12.078	-25.505***	-54.124***
DR	-17.435*	-20.078**	-13.913*	-19.230**
GO	-2.486	-6.403	0.470	5.103
FS	-16.084***	-10.786***	-7.958***	-16.897***
FTA	-35.983**	-68.129***	-130.203***	-42.368***
QR	31.920***	24.209***	17.358***	34.959***
_cons	206.485***	159.379***	222.140***	228.872***
Countries	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes
Adjusted R²	0.3401	0.42	0.5926	0.3948
N	364	364	364	364

This table presents the economic state condition test results (International Covid and Pre-covid), starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 to 7). Finally (column 8), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.

Table 4 (Continued) Effect of national culture dimension on CCC (in condition of International Covid and Pre-covid)

	5	6	7	8
Dependent Variables(t)	CCC	CCC	CCC	CCC
Period	2007~2021	2007~2021	2007~2021	2007~2021
Dummy				
Dummy1(Covid)	Yes	Yes	Yes	Yes
Dummy2(Pre-covid)	Yes	Yes	Yes	Yes
Interaction Effect				
PDI*Dummy1				0.072
PDI*Dummy2				0.177**
IDV*Dummy1				-0.492***
IDV*Dummy2				-0.592***
MAS*Dummy1				-0.017
MAS*Dummy2				-0.053
UAI*Dummy1	-0.315***			-0.374***
UAI*Dummy2	-0.192***			-0.238***
LTO*Dummy1		0.402***		0.191**
LTO*Dummy2		0.347***		0.142***
IVR*Dummy1			-0.249**	0.194
IVR*Dummy2			-0.152**	0.418***
Control Variables(t-1)				
EG	111.272***	64.696**	102.406***	-22.652
CF	-56.022***	-4.980	-23.673*	-55.362***
DR	-7.518	-26.115***	-19.807**	0.343
GO	-0.266	-8.108	-6.663	11.127*
FS	-16.515***	-16.598***	-13.716***	-11.390***
FTA	-6.043	-11.167	-43.852***	-84.812***
QR	30.089***	21.886***	29.205***	13.683***
_cons	210.045***	193.459***	198.745***	218.584***
Countries	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes
Adjusted R²	0.3873	0.4369	0.353	0.7182
N	364	364	364	364

This table presents the economic state condition test results (International Covid and Pre-covid), starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 to 7). Finally (column 8), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.

IDV and UAI are both significant at a 1% level in both International Covid and Pre-covid conditions. LTO is found significant at a 5% level in the condition of International Covid, while significant at a 1% level in the condition of Pre-covid. MAS, on the contrary, no significant relationship was found.

Compare with the absolute value of coefficients, IDV has a bigger impact on the length of CCC in the condition of Pre-covid. UAI and LTO have a bigger impact on CCC in the condition of International Covid.

During the period of Covid, companies were expected to increase their cash holdings. Compared with the pre-covid period, the number of days accounts payable is extended. Therefore, the impact of IDV on the length of CCC during the covid period is smaller than that during the Pre-covid period.

During the Covid period, economic activities were strictly controlled. In order to cope with the cash flow crisis, companies paid more attention to inventory management to enhance their competitive advantage. Therefore, the impact of UAI on the length of CCC during the Covid period was greater than that of the period Pre-covid.

During the Covid period, the degree of cultural members' acceptance of delayed satisfaction of their material needs increased, and their desire to shop decreased. Therefore, the impact of LTO on the length of CCC during the Covid period is greater than that Pre-covid period.

In summary, hypothese7 that the influence of national culture on CCC will change at different economic conditions is supported.

4.3 Robustness Test

To ensure that our quantitative model is "valid", several robustness tests were performed with the same method (Pooled OLS Regression) as those tests before.

4.3.1 Robustness Test for Baseline

This study has previously confirmed that Hofstede's cultural dimensions affect the cash conversion cycle, another three alternative cultural frameworks are chosen to help confirm the robustness of the model. By controlling for different national cultural dimensions, significant results demonstrate that national culture has an impact on WCM.

Appendix 12 showed the regression result with Schwartz's Framework. Schwartz 'Framework learns and develops the theories of Hofstede (1980) cultural dimensions and Inglehart (1977) modernization theory, Schwartz posits seven a priori cultural value orientations that correspond to cultural ideals, seven dimensions are harmony, embeddedness, hierarchy, mastery, affective autonomy, intellectual autonomy, and egalitarianism. Harmony, hierarchy, and affective autonomy are significant at a 1% level. Embeddedness and egalitarianism are significant at a 10% level. Mastery and intellectual autonomy didn't show any significant relationship with the length of CCC. It can be concluded that Schwartz's Framework has an influence on working capital management.

Appendix 13 shows the regression result with the GLOBE project framework. The GLOBE program has identified nine cultural dimensions that are performance orientation, assertiveness, future orientation, humane orientation, gender egalitarianism, institutional collectivism, in-group collectivism, power distance, and uncertainty avoidance (GLOBE 2004 study). Which is similar to the Hofstede culture dimension. The regression result of the GLOBE project showed that dimensions have a strong influence on CCC when the dimensions are significant, it supports the result of Hofstede's culture dimension for this study.

Appendix 14 presented the regression results with WVS. The World Values Survey is a study that explores people's values and beliefs, as well as their attitudes toward different social and political issues. There are two main aspects of intercultural differences in the world that are presented traditional values versus secular-rational values and survival values versus self-expression values. The results show that both traditional values and survival values are significant at a 1% level. The influence of national culture on WCM is also proved by the regression results of the WVS project.

4.3.2 Robustness Test for the Economic Condition of Expansion and Recession

For robustness testing, another business cycle from 2000 to 2006 is chosen to combine with the period before, to contribute a consecutive period with two business cycles, based on the business cycle information from Macromicro. And data from 18 countries during this period are collected. This study tested the period 2000-2021 within

these 18 countries, the result is shown in Appendix 15. The results for the national culture dimension IDV and UAI are the same as the result in the period 2007-2021.

Except for another business cycle, Schwartz's Framework has also been used to robustness test for the economic condition of expansion and recession. The result showed in Appendix 16. Harmony, embeddedness, hierarchy, mastery, affective autonomy, and egalitarianism are significant at 1% level. Compared with the absolute value, all these dimensions have a bigger impact on CCC in the conditions of economic expansion than in the conditions of economic recession. While intellectual autonomy didn't show any statistical significance in any condition.

4.3.2 Robustness Test for the Economic Condition of International Covid and Pre-covid

For robustness testing of the Pre-covid period and the Covid period, another Pre-covid period 2000-2018 is used. The regression result is shown in Appendix 17. The results showed the same results on IDV and UAI as before, having different impacts on the length of CCC with conditions of Pre-covid and Covid.

Also, Schwartz's Framework has also been used to robustness test for the economic condition of International Covid and Pre-covid in the period of 2007-2021. The result is presented in Appendix 18. Harmony and hierarchy have a bigger impact on the length of CCC in the condition of Pre-covid than International Covid. Embeddedness, mastery, affective autonomy, and egalitarianism are significant in the condition of Pre-covid and no significant relationship was found in the condition of International Covid. For intellectual autonomy, no statistically significant correlation was found in either conditions.

4.4 Summary of Hypotheses Results

A summary of the hypotheses results is presented in Table 5. In total 7 hypotheses, 6 of the hypotheses' results are supported. Only the hypothesis 4 result is not supported.

Table 5 Summary of the Hypothesis Results

Hypothesis	Cultural Dimension	Working Capital Measure	Expected Relationship	Result
H1	Power Distance	CCC	Positive	Positive
H2	Individualism	CCC	Negative	Negative
H3	Uncertain. Avoidance	CCC	Positive/Negative	Negative
H4	Masculinity	CCC	Positive/Negative	Not Supported
H5	Long Term Orientation	CCC	Positive/Negative	Positive
H6	Indulgence	CCC	Positive/Negative	Positive
H7	6 National Culture Dimensions	CCC	Performance different between economic conditions	Supported

This table presents results for all the 7 hypotheses. From row 1 to row 6 are the result for individual impact of each Hofstede's national culture dimensions on CCC. Row 7 is the result for if exist different performance of Hofstede's national culture dimensions on different economic conditions.

5. Conclusion

This study uses a sample of 3851 company observations from 26 countries during 2007-2021 to examine whether national culture is an important factor to impact working capital management strategies and if the impact of national culture will be changed in different economic conditions. The cash conversion cycle is used to represent the effectiveness of working capital management. The shorter the length of CCC is, the more efficient firms' WCM will be.

In this study, Hofstede's cultural dimensions are used to research the relationship between national culture and working capital management, Pooled OLS regression model was chosen to test significant trends between national cultural dimensions and cash conversion cycle (CCC). The result of this study illustrates that PDI, IDV, UAI, LTO, and IVR have a strong correlation with working capital management in the chosen period. To test if the influence factor changed with different economic conditions, 4 economic conditions were defined to establish the regression models.

Comparing the condition of economic expansion and the condition of economic recession, IDV and UAI showed robust performance during all the chosen periods with a significant level of 0.01. IDV plays more impact on the length of CCC with the conditions of economic expansion than economic recession. On the other hand, UAI plays more impact on the length of CCC in the condition of economic recession compared with the condition of economic expansion.

Comparing the condition of Pre-covid and international Covid, IDV, and UAI showed robust performance during all the chosen periods. IDV plays more impact on CCC with the condition of Pre-covid compared with the condition of Covid. UAI plays more impact on CCC with the condition of Covid compared with the condition of Pre-covid.

The results confirm that culture influences WCM differently under different economic conditions.

Even though this study has tried to reduce the limiting factors but still there are some limitations left. The major limitations of the present study are: First, the firm level comes from the Thomson Worldscope database, and the data have a bias toward large

firms not comprehensive. Second, the data comes from different countries, and the accounting standard used is not the same, except for what the Thomson Worldscope database does, no clear way to make the data more comparable across countries. Third, the data comes from 26 countries, but after data processing, only 3851 samples were left, for this topic, the sample size is not big, and lack of reliable data. Fourth, this study doesn't separate the firm scale and industries, and for country-level variables, only GDP growth is considered, this will lead to some omitted variable problems. Fifth, because external sources are limited, the data used to define the business cycle is limited, and the countries to test the change of different economic conditions are limited.

This study focuses on establishing if the correlation will be different in the different economic conditions between national culture and working capital management. To complete this research and address the hypotheses discussed, the following suggestions for future research are given.

First, this study focuses on testing all companies and all industries, in the future, further research could separate companies into small-size, mid-size, and big-size companies, and test different industries and compare if the performance is different with all-size companies and different industries.

Second, since the models in this study fail to account for all variations in the cash conversion cycle, the determinants of the cash conversion cycle should be further investigated to gain a deeper understanding of this complex phenomenon. Understanding this phenomenon holistically will lead to better financial modelling and improved working capital management practices.

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Appendix

Appendix 1 Descriptive Statistics for sample data

	OFN	FFN	CCC	PDI	IDV	MAS	UAI	LTO
Australia	1727	66	64.33	38	90	61	51	21
Canada	2238	67	62.97	39	80	52	48	36
Chile	120	33	85.68	63	23	28	86	31
China	5823	1270	112.14	80	20	66	30	87
Denmark	162	15	85.31	18	74	16	23	35
Finland	161	18	60.81	33	63	26	59	38
France	603	53	75.15	68	71	43	86	63
Germany	584	79	80.90	35	67	66	65	83
Greece	156	40	93.53	60	35	57	100	45
Hong Kong	1320	250	91.53	68	25	57	29	61
Indonesia	678	107	103.96	78	14	46	48	62
Italy	314	37	55.72	50	76	70	75	61
Japan	3777	11	79.17	54	46	95	92	88
Netherlands	118	17	62.46	38	80	14	53	67
New Zealand	116	11	51.71	22	79	58	49	33
Peru	75	16	72.06	64	16	42	87	25
Poland	577	25	57.61	68	60	64	93	38
Singapore	607	103	124.53	74	20	48	8	75
South Africa	755	30	50.15	49	65	63	49	34
South Korea	2293	857	93.75	60	18	39	85	100
Spain	181	15	75.85	57	51	42	86	48
Sweden	873	23	93.94	31	71	5	29	53
Switzerland	217	51	81.12	34	68	70	58	74
Thailand	748	135	95.35	64	20	34	64	32
United Kingdom	1049	145	81.34	35	89	66	35	51
United States	5622	377	74.66	40	91	62	46	26
Total/Mean	30894	3851	79.45	50.77	54.31	49.62	59.00	52.58

This table displays the variables for different countries. The 26 countries are presented in the first column, OFN is the number of the firm sample original, and FFN is the final number of the firm samples left. Except for the OFN and FFN, mean value of dependent variables CCC, independent variables PDI, IDV, MAS, UAI, LTO, IVR and mean value of control variables EG, CF, DR, GO, FD, FTA, QR for each country are presented.

Appendix 1 (Continued) Descriptive Statistics for sample data

	IVR	EG	CF	DR	GO	FS	FTA	QR
Australia	71	0.03	0.23	0.44	0.10	8.56	0.42	1.25
Canada	68	0.02	0.21	0.48	0.14	8.83	0.51	1.36
Chile	68	0.03	0.19	0.43	0.07	8.81	0.53	1.39
China	24	0.08	0.21	0.40	0.31	8.79	0.43	1.44
Denmark	70	0.01	0.27	0.48	0.06	8.82	0.39	1.00
Finland	57	0.01	0.19	0.56	0.04	8.87	0.42	1.08
France	48	0.01	0.15	0.54	0.05	9.06	0.35	1.13
Germany	40	0.01	0.16	0.53	0.06	8.90	0.38	1.43
Greece	50	-0.02	0.12	0.61	0.04	8.28	0.52	1.44
Hong Kong	17	0.02	0.29	0.35	0.21	8.59	0.45	1.81
Indonesia	38	0.05	0.27	0.48	0.10	8.46	0.48	1.30
Italy	30	0.00	0.10	0.66	0.03	8.81	0.43	1.11
Japan	42	0.00	0.11	0.55	0.02	9.46	0.35	1.53
Netherlands	68	0.01	0.15	0.62	0.04	9.26	0.39	1.21
New Zealand	75	0.02	0.33	0.41	0.09	8.44	0.47	1.01
Peru	46	0.04	0.32	0.38	0.11	8.39	0.55	1.16
Poland	29	0.04	0.17	0.48	0.12	8.23	0.40	1.09
Singapore	46	0.04	0.26	0.39	0.09	8.32	0.38	1.91
South Africa	63	0.02	0.31	0.50	0.06	8.88	0.42	1.28
South Korea	29	0.03	0.19	0.42	0.12	8.29	0.49	1.72
Spain	44	0.00	0.15	0.66	0.05	8.96	0.48	1.12
Sweden	78	0.02	0.29	0.51	0.06	8.95	0.28	1.45
Switzerland	66	0.02	0.26	0.47	0.06	9.06	0.37	1.59
Thailand	45	0.03	0.36	0.40	0.09	8.14	0.52	1.44
United Kingdom	69	0.01	0.20	0.54	0.06	8.72	0.36	1.21
United States	68	0.02	0.24	0.45	0.09	9.00	0.39	2.04
Total/Mean	51.88	0.02	0.22	0.49	0.09	8.73	0.43	1.37

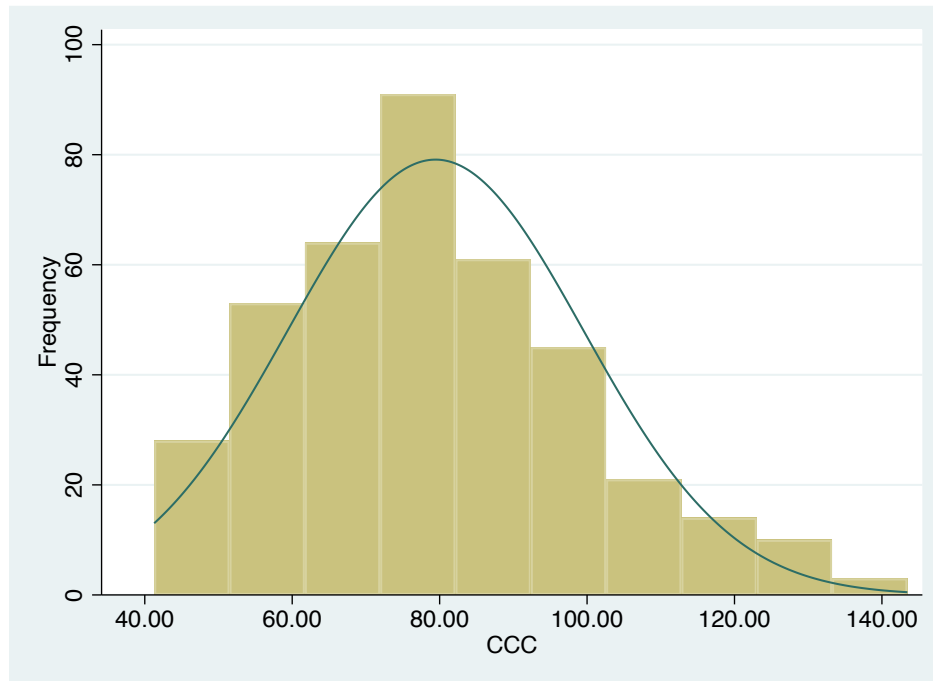
This table displays the variables for different countries. The 26 countries are presented in the first column, OFN is the number of the firm sample original, and FFN is the final number of the firm samples left. Except for the OFN and FFN, mean value of dependent variables CCC, independent variables PDI, IDV, MAS, UAI, LTO, IVR and mean value of control variables EG, CF, DR, GO, FD, FTA, QR for each country are presented.

Appendix 2 Descriptive Statistics for panel data in period of 2007-2021

Variable	N	Mean	SD	Max	Min
CCC	390	79.45	20.09	143.46	41.28
PDI	390	50.77	17.25	80.00	18.00
IDV	390	54.31	26.33	91.00	14.00
MAS	390	49.62	20.12	95.00	5.00
UAI	390	59.00	24.62	100.00	8.00
LTO	390	52.58	21.77	100.00	21.00
IVR	390	51.88	17.28	78.00	17.00
EG	390	0.02	0.04	0.15	-0.11
CF	390	0.22	0.10	0.79	0.03
DR	390	0.49	0.11	0.85	0.15
GO	390	0.09	0.13	0.84	-0.22
FS	390	8.73	0.35	9.53	7.85
FTA	390	0.43	0.07	0.60	0.25
QR	390	1.37	0.30	2.30	0.82

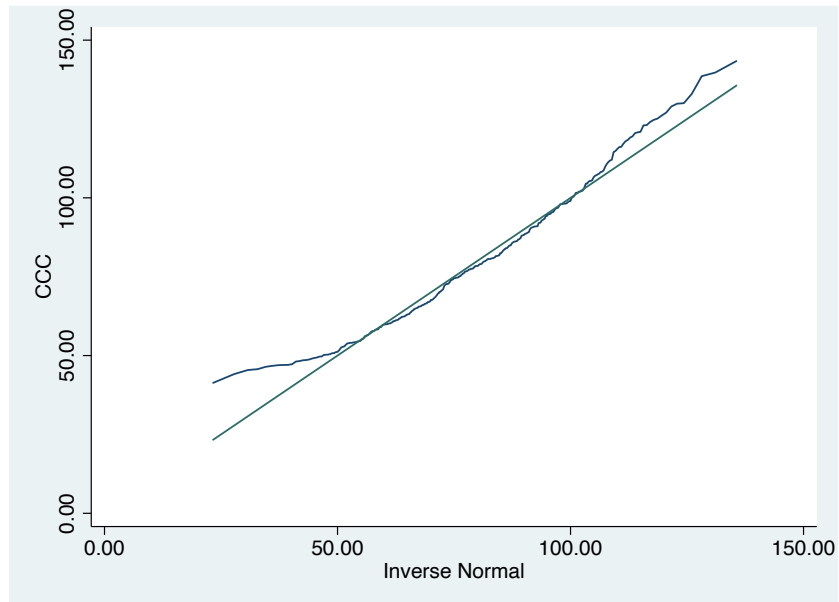
This table presents the descriptive statistics for regression panel data in the period of 2007-2021. Including the panel data items number, mean value, standard deviation, maximum value and minimum value for all the dependent variables, independent variables and control variables.

Appendix 3. Histogram of CCC distribution



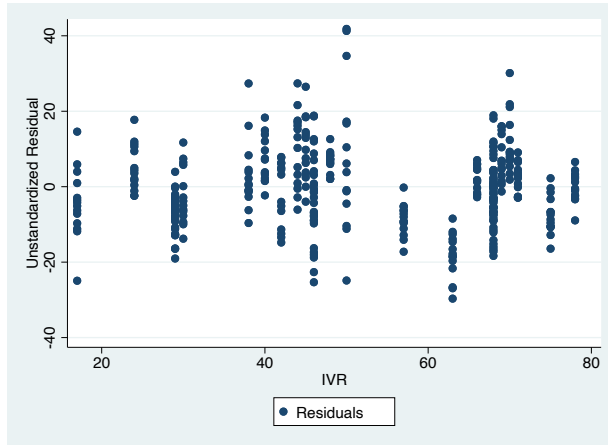
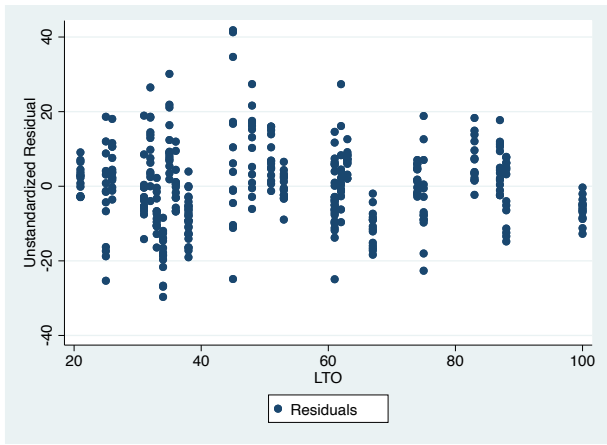
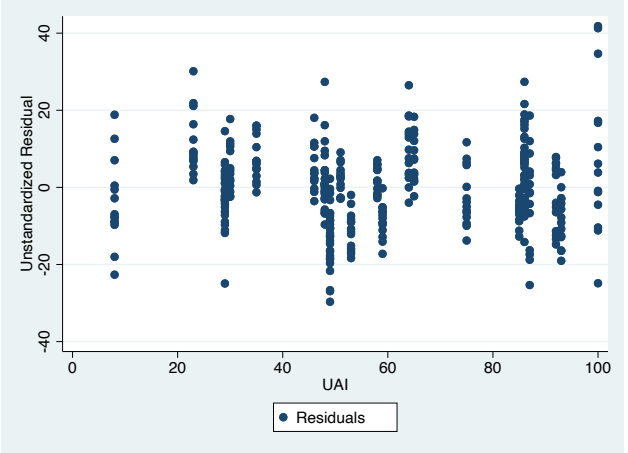
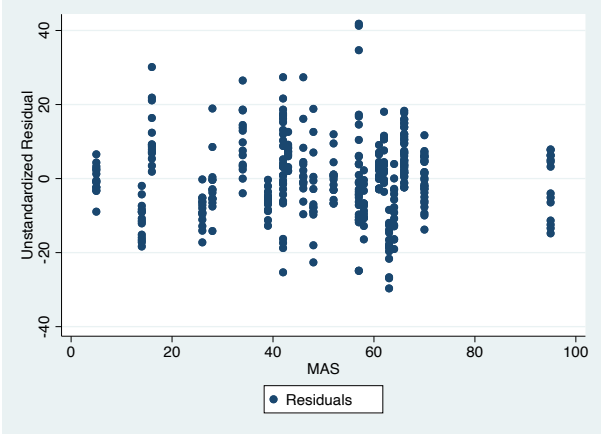
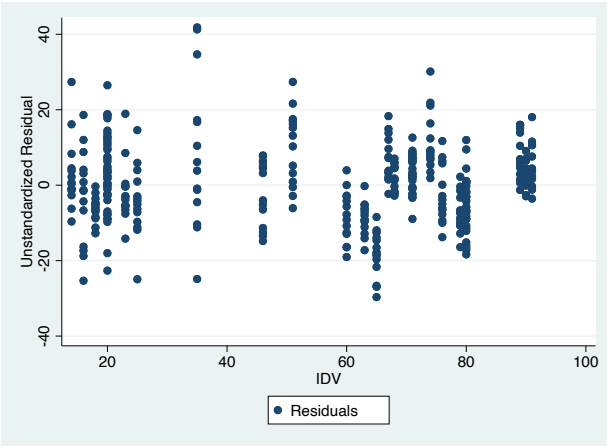
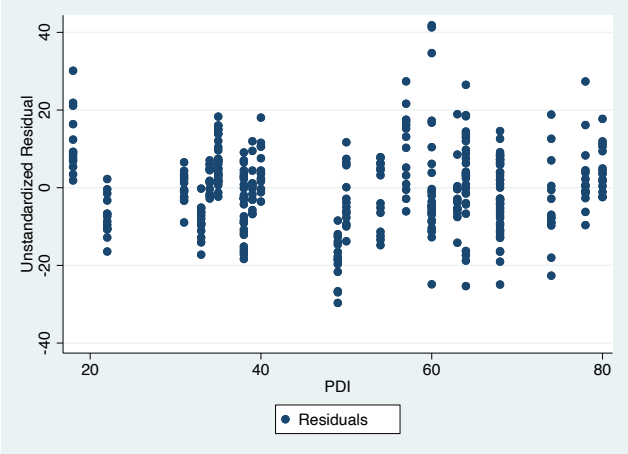
This figure presents the distribution of CCC of all 26 countries in period of 2007-2021. For obviation of normal distribution like hood of dependent variable.

Appendix 4 Residuals Q-Q for CCC in period of 2007-2021

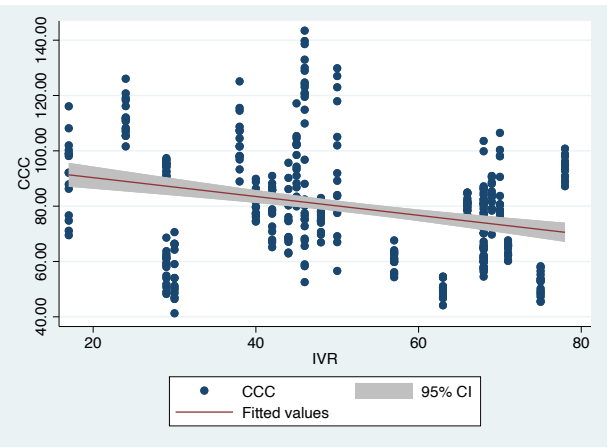
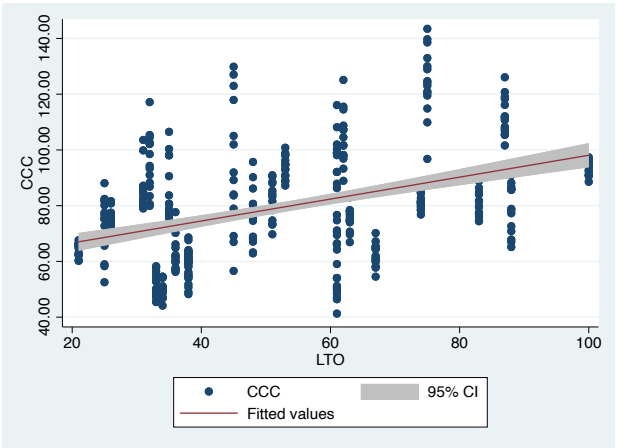
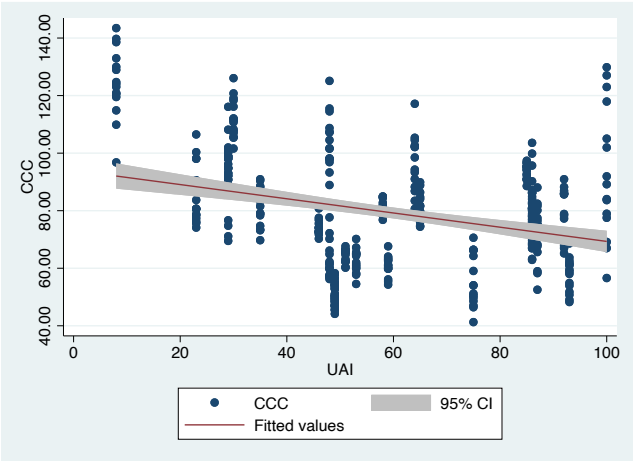
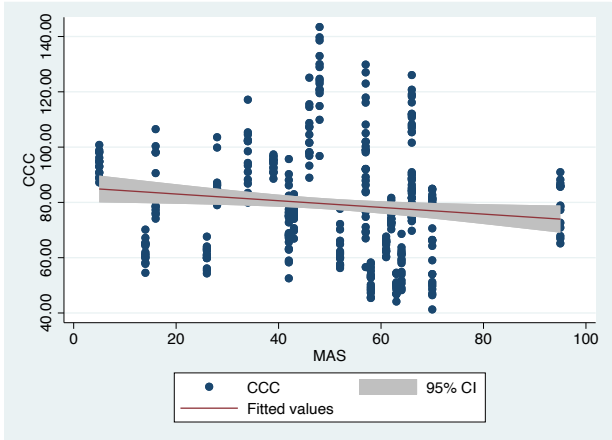
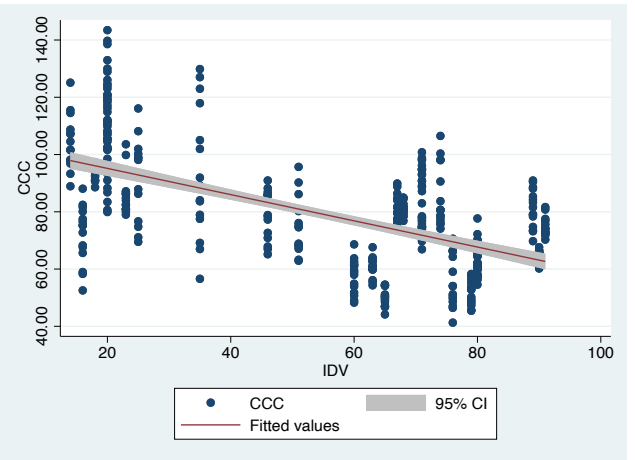
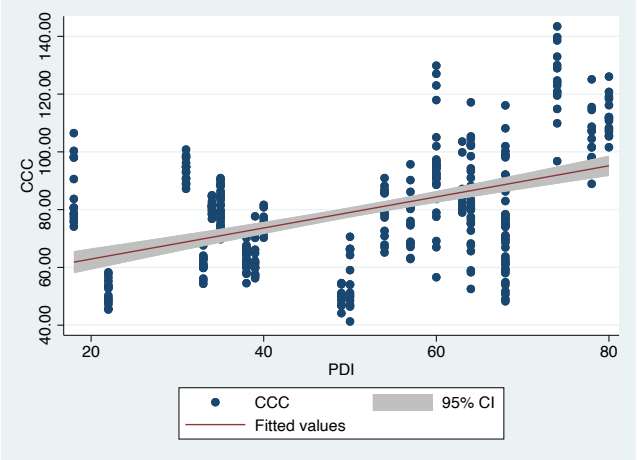


This figure presents the residuals test of CCC with all 26 countries in period of 2007-2021. For obviating of normal distribution like hood of dependent variable CCC.

Appendix 5 Heteroskedasticity



Appendix 6 Linearity of CCC with Hofstede's national culture dimensions



Appendix 7 Pearson Correlation Matrix for all variables

Variables	PDI	IDV	MAS	UAI	LTO	IVR	EG	CF	DR	GO	FS	FTA	QR	CCC
(1) PDI	1.000													
(2) IDV	-0.786* (0.000)	1.000												
(3) MAS	0.168* (0.001)	0.075 (0.139)	1.000											
(4) UAI	0.243* (0.000)	-0.158* (0.002)	0.191* (0.000)	1.000										
(5) LTO	0.278* (0.000)	-0.296* (0.000)	0.238* (0.000)	-0.012 (0.806)	1.000									
(6) IVR	-0.734* (0.000)	0.616* (0.000)	-0.339* (0.000)	-0.255* (0.000)	-0.516* (0.000)	1.000								
(7) EG	0.275* (0.000)	-0.278* (0.000)	-0.013 (0.795)	-0.169* (0.001)	0.075 (0.137)	-0.164* (0.001)	1.000							
(8) CF	-0.055 (0.276)	-0.139* (0.006)	-0.183* (0.000)	-0.378* (0.000)	-0.285* (0.000)	0.178* (0.000)	0.405* (0.000)	1.000						
(9) DR	-0.188* (0.000)	0.323* (0.000)	0.003 (0.959)	0.284* (0.000)	0.081 (0.112)	0.071 (0.163)	-0.271* (0.000)	-0.361* (0.000)	1.000					
(10) GO	0.206* (0.000)	-0.185* (0.000)	0.057 (0.258)	-0.151* (0.003)	0.065 (0.203)	-0.206* (0.000)	0.630* (0.000)	0.427* (0.000)	-0.155* (0.002)	1.000				
(11) FS	-0.350* (0.000)	0.450* (0.000)	0.065 (0.198)	-0.018 (0.716)	0.218* (0.000)	0.278* (0.000)	-0.207* (0.000)	-0.368* (0.000)	0.315* (0.000)	-0.202* (0.000)	1.000			
(12) FTA	0.363* (0.000)	-0.524* (0.000)	-0.056 (0.268)	0.357* (0.000)	-0.309* (0.000)	-0.224* (0.000)	0.030 (0.553)	0.036 (0.483)	-0.173* (0.001)	0.030 (0.550)	-0.461* (0.000)	1.000		
(13) QR	0.250* (0.000)	-0.275* (0.000)	0.188* (0.000)	-0.231* (0.000)	0.326* (0.000)	-0.174* (0.001)	0.026 (0.605)	0.111* (0.028)	-0.311* (0.000)	0.092* (0.070)	0.000 (0.996)	-0.091* (0.073)	1.000	
(14) CCC	0.462* (0.000)	-0.600* (0.000)	-0.121* (0.017)	-0.303* (0.000)	0.426* (0.000)	-0.293* (0.000)	0.167* (0.001)	0.045 (0.371)	-0.299* (0.000)	0.113* (0.025)	-0.219* (0.000)	-0.008 (0.876)	0.486* (0.000)	1.000

This table displays the correlation between the different variables. The samples contain 26 countries and cover the period from 2007 to 2021. Significant values of the coefficients are also shown in the table. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Appendix 8 Hofstede's National Culture Dimensions

Country	PDI	IDV	MAS	UAI	LTO	IVR
Australia	38	90	61	51	21	71
Canada	39	80	52	48	36	68
Chile	63	23	28	86	31	68
China	80	20	66	30	87	24
Denmark	18	74	16	23	35	70
Finland	33	63	26	59	38	57
France	68	71	43	86	63	48
Germany	35	67	66	65	83	40
Greece	60	35	57	100	45	50
Hong Kong	68	25	57	29	61	17
Indonesia	78	14	46	48	62	38
Italy	50	76	70	75	61	30
Japan	54	46	95	92	88	42
Netherlands	38	80	14	53	67	68
New Zealand	22	79	58	49	33	75
Peru	64	16	42	87	25	46
Poland	68	60	64	93	38	29
Singapore	74	20	48	8	75	46
South Africa	49	65	63	49	34	63
South Korea	60	18	39	85	100	29
Spain	57	51	42	86	48	44
Sweden	31	71	5	29	53	78
Switzerland	34	68	70	58	74	66
Thailand	64	20	34	64	32	45
United Kingdom	35	89	66	35	51	69
United States	40	91	62	46	26	68

This table presents the Hofstede's national culture dimensions value for selected 26 countries. The data are come from Hofstede Insights:<https://www.hofstede-insights.com/product/compare-countries/>.

Appendix 9 Schwartz's National Culture Dimensions

Country	harmony	embedded	hierarchy	mastery	aff auton	intel auton	egalitar
Australia	3.99	3.59	2.29	3.97	3.86	4.35	4.79
Canada	3.83	3.46	2.09	4.12	4.00	4.50	4.80
Chile	4.33	3.64	2.25	3.78	3.03	4.32	5.06
China	3.78	3.74	3.49	4.41	3.30	4.18	4.23
Denmark	4.16	3.19	1.86	3.91	4.30	4.77	5.03
Finland	4.34	3.37	1.80	3.66	3.96	4.93	4.90
France	4.21	3.20	2.21	3.72	4.39	5.13	5.05
Germany	4.62	3.03	1.87	3.86	4.11	4.99	5.07
Greece	4.40	3.41	1.83	4.25	3.92	4.39	4.84
Hong Kong	3.50	3.76	2.91	4.08	3.20	4.28	4.50
Indonesia	3.82	4.27	2.56	3.84	3.41	3.94	4.32
Italy	4.62	3.46	1.60	3.81	3.30	4.91	5.27
Japan	4.21	3.49	2.65	4.06	3.76	4.78	4.36
Netherlands	4.05	3.19	1.91	3.97	4.13	4.85	5.03
New Zealand	4.03	3.27	2.27	4.09	4.21	4.65	4.94
Peru	3.71	3.92	2.76	4.08	2.98	4.30	4.84
Poland	3.86	3.86	2.51	3.84	3.32	4.31	4.48
Singapore	3.76	4.00	2.82	3.88	3.30	3.86	4.60
South Africa	3.86	4.03	2.59	3.89	3.48	3.85	4.52
South Korea	3.57	3.68	2.90	4.21	3.46	4.22	4.42
Spain	4.47	3.31	1.84	3.80	3.67	4.99	5.23
Sweden	4.46	3.12	1.83	3.81	4.24	5.09	4.90
Switzerland	4.40	3.04	2.06	3.74	4.33	5.32	5.06
Thailand	3.84	4.02	3.23	3.88	3.63	4.02	4.29
United Kingdom	3.91	3.34	2.33	4.01	4.26	4.62	4.92
United States	3.46	3.67	2.37	4.09	3.87	4.19	4.68

This table presents the Schwartz's national culture dimensions value for selected 26 countries. Coming from: [http://www.researchgate.net/publication/304715744_The_7_Schwartz_cultural_value_orientation_s_cores_for_80_countries](http://www.researchgate.net/publication/304715744_The_7_Schwartz_cultural_value_orientation_cores_for_80_countries).

Appendix 10 GLOBE National Culture Dimensions

Country	Uncertainty Avoidance Societal Practices	Future Orientation Societal Practices	Power Distance Societal Practices	Collectivism I Societal Practices (Institutional Collectivism)	Humane Orientation Societal Practices
Australia	4.39	4.09	4.74	4.29	4.28
Canada	4.58	4.44	4.82	4.38	4.49
China	4.94	3.75	5.04	4.77	4.36
Denmark	5.22	4.44	3.89	4.80	4.44
Finland	5.02	4.24	4.89	4.63	3.96
France	4.43	3.48	5.28	3.93	3.40
Germany	5.22	4.27	5.25	3.79	3.18
Greece	3.39	3.40	5.40	3.25	3.34
Hong Kong	4.32	4.03	4.96	4.13	3.90
Indonesia	4.17	3.86	5.18	4.54	4.69
Italy	3.79	3.25	5.43	3.68	3.63
Japan	4.07	4.29	5.11	5.19	4.30
Netherlands	4.70	4.61	4.11	4.46	3.86
New Zealand	4.75	3.47	4.89	4.81	4.32
Poland	3.62	3.11	5.10	4.53	3.61
Singapore	5.31	5.07	4.99	4.90	3.49
South Africa	4.59	4.64	4.11	4.39	4.34
South Korea	3.55	3.97	5.61	5.20	3.81
Spain	3.97	3.51	5.52	3.85	3.32
Sweden	5.32	4.39	4.85	5.22	4.10
Switzerland	5.37	4.73	4.90	4.06	3.60
Thailand	3.93	3.43	5.63	4.03	4.81
United Kingdom	4.65	4.28	5.15	4.27	3.72
United States	4.15	4.15	4.88	4.20	4.17

This table presents the GLOBE's national culture dimensions value for 24 of the selected countries. Two of the countries are not in GLOBE project. The data come from: <https://www.globeproject.com/results#country>

Appendix 10 (Continued) GLOBE National Culture Dimensions

Country	Performance Orientation Societal Practices	Collectivism II Societal Practices (In-group Collectivism)	Gender Egalitarianism Societal Practices	Assertiveness Societal Practices
Australia	4.36	4.17	3.40	4.28
Canada	4.49	4.26	3.70	4.05
China	4.45	5.80	3.05	3.76
Denmark	4.22	3.53	3.93	3.80
Finland	3.81	4.07	3.35	3.81
France	4.11	4.37	3.64	4.13
Germany	4.25	4.02	3.10	4.55
Greece	3.20	5.27	3.48	4.58
Hong Kong	4.80	5.32	3.47	4.67
Indonesia	4.41	5.68	3.26	3.86
Italy	3.58	4.94	3.24	4.07
Japan	4.22	4.63	3.19	3.59
Netherlands	4.32	3.70	3.50	4.32
New Zealand	4.72	3.67	3.22	3.42
Poland	3.89	5.52	4.02	4.06
Singapore	4.90	5.64	3.70	4.17
South Africa	4.66	5.09	3.66	4.36
South Korea	4.55	5.54	2.50	4.40
Spain	4.01	5.45	3.01	4.42
Sweden	3.72	3.66	3.84	3.38
Switzerland	4.94	3.97	2.97	4.51
Thailand	3.93	5.70	3.35	3.64
United Kingdom	4.08	4.08	3.67	4.15
United States	4.49	4.25	3.34	4.55

This table presents the GLOBE's national culture dimensions value for 24 of the selected countries. Two of the countries are not in GLOBE project. The data come from: <https://www.globeproject.com/results#country>

Appendix 11 World Values Survey's national culture dimension

Country	Survival	Traditional
Australia	2.29	0.59
Canada	2.08	0.83
Chile	-0.08	0.22
China	-0.10	0.60
Denmark	2.92	1.06
Finland	2.48	0.83
France	1.93	0.50
Germany	2.19	0.92
Greece	-0.25	0.27
Hong Kong	-0.04	1.47
Indonesia	-0.80	-1.22
Italy	0.83	0.37
Japan	1.33	1.64
Netherlands	2.53	0.74
New Zealand	2.88	0.57
Peru	-0.53	-1.05
Poland	0.63	-0.38
Singapore	-0.10	0.10
South Africa	0.06	-0.26
South Korea	-0.46	1.47
Spain	1.46	0.61
Sweden	3.14	1.15
Switzerland	2.38	0.71
Thailand	0.10	0.27
United Kingdom	2.36	0.44
United States	1.43	0.17

This table presents the World Values Survey's national culture dimensions value for 26 selected countries. The data come from: <https://www.worldvaluessurvey.org/WVSEventsShow.jsp?ID=428>.

Appendix 12 Effect of National Culture Dimensions (Schwartz) on CCC

	1	2	3	4	5
Dependent Variables(t)	CCC	CCC	CCC	CCC	CCC
Period	2007~2021	2007~2021	2007~2021	2007~2021	2007~2021
National Culture Dimensions					
Harmony		11.327***			
Embeddedness			1.961		
Hierarchy				10.402***	
Mastery					0.549
Affective Autonomy					
Intellectual Autonomy					
Egalitarianism					
Control Variables(t-1)					
EG	112.909***	123.412***	108.097***	79.611**	112.881***
CF	-38.494***	-34.571***	-38.855***	-38.466***	-38.264***
DR	-17.435*	-26.926***	-17.017*	-4.400	-17.336*
GO	-2.486	-1.333	-1.902	-4.760	-2.706
FS	-16.084***	-17.727***	-15.511***	-13.911***	-16.064***
FTA	-35.983**	-28.276*	-38.923**	-45.873***	-36.359**
QR	31.920***	35.653***	31.428***	27.430***	31.834***
_cons	206.485***	170.053***	196.398***	168.019***	204.343***
Countries	Yes	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes	Yes
Adjusted R²	0.3401	0.3582	0.3389	0.3701	0.3383
N	364	336	336	336	336

This table presents the robustness test for the baseline results (with Schwartz national culture dimensions), starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 to 8). Finally (column 9), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.

**Appendix 12 (Continued) Effect of National Culture Dimensions (Schwartz)
on CCC**

	6	7	8	9
Dependent Variables(t)	CCC	CCC	CCC	CCC
Period	2007~2021	2007~2021	2007~2021	2007~2021
National Culture Dimensions				
Harmony				35.363***
Embeddedness				20.696*
Hierarchy				27.273***
Mastery				9.008
Affective Autonomy	-0.322			14.350***
Intellectual Autonomy		-0.073		-0.581
Egalitarianism			-8.179**	14.551*
Control Variables(t-1)				
EG	111.863***	112.752***	97.770***	79.436**
CF	-38.257***	-38.505***	-36.998***	-39.519***
DR	-17.395*	-17.404*	-13.568	-15.283*
GO	-2.518	-2.472	-3.067	0.295
FS	-16.022***	-16.053***	-14.340***	-14.759***
FTA	-36.932**	-36.110**	-36.211**	-33.350*
QR	31.813***	31.890***	29.340***	34.310***
_cons	207.655***	206.630***	232.075***	-246.245*
Countries	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes
Adjusted R²	0.3383	0.3383	0.3479	0.4628
N	336	336	336	336

This table presents the robustness test for the baseline results (with Schwartz national culture dimensions), starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 to 8). Finally (column 9), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.

Appendix 13 Effect of National Culture Dimensions (GLOBE) on CCC

	1	2	3	4
Dependent Variables(t)	CCC	CCC	CCC	CCC
Period	2007~2021	2007~2021	2007~2021	2007~2021
National Culture Dimensions				
Uncertainty Avoidance		12.013***		
Future Orientation,			5.916**	
Power Distance				7.697***
Institutional Collectivism				
Humane Orientation				
Performance Orientation				
In-group Collectivism				
Gender Egalitarianism				
Assertiveness				
Control Variables(t-1)				
EG	112.909***	100.421***	105.026***	104.653***
CF	-38.494***	-66.063***	-50.259***	-27.398**
DR	-17.435*	-6.146	-17.454*	-24.444**
GO	-2.486	3.981	2.238	-3.820
FS	-16.084***	-22.626***	-19.759***	-12.615***
FTA	-35.983**	4.717	-31.155*	-50.239***
QR	31.920***	34.527***	28.674***	28.586***
_cons	206.485***	189.142***	219.245***	149.465***
Countries	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes
Adjusted R²	0.3401	0.4056	0.3542	0.359
N	364	336	336	336

This table presents the robustness test for the baseline results (with GLOBE national culture dimensions), starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 to 10). Finally (column 11), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.

**Appendix 13 (Continued) Effect of National Culture Dimensions (GLOBE)
on CCC**

	5	6	7	8
Dependent Variables(t)	CCC	CCC	CCC	CCC
Period	2007~2021	2007~2021	2007~2021	2007~2021
National Culture Dimensions				
Uncertainty Avoidance				
Future Orientation,				
Power Distance				
Institutional Collectivism	4.370**			
Humane Orientation		2.811		
Performance Orientation			-4.845*	
In-group Collectivism				9.553***
Gender Egalitarianism				
Assertiveness				
Control Variables(t-1)				
EG	95.527***	105.454***	119.883***	53.876
CF	-42.966***	-47.605***	-34.613***	-19.899
DR	-13.655	-15.695	-25.464**	-24.504**
GO	-0.087	-0.707	-2.768	-5.312
FS	-17.058***	-17.908***	-14.562***	-9.179***
FTA	-31.514*	-49.187***	-37.616**	-85.284***
QR	31.829***	32.353***	33.050***	24.090***
_cons	193.098***	217.109***	215.789***	133.363***
Countries	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes
Adjusted R²	0.3496	0.3436	0.3469	0.4016
N	336	336	336	336

This table presents the robustness test for the baseline results (with GLOBE national culture dimensions), starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 to 10). Finally (column 11), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.

Appendix 13 (Continued) Effect of National Culture Dimensions (GLOBE)

on CCC

	9	10	11
Dependent Variables(t)	CCC	CCC	CCC
Period	2007~2021	2007~2021	2007~2021
National Culture Dimensions			
Uncertainty Avoidance			22.100***
Future Orientation,			5.984*
Power Distance			11.501***
Institutional Collectivism			3.035
Humane Orientation			7.659**
Performance Orientation			-15.014***
In-group Collectivism			14.140***
Gender Egalitarianism	-2.831		-2.116
Assertiveness		-13.396***	2.231
Control Variables(t-1)			
EG	104.565***	94.105***	2.085
CF	-39.698***	-52.275***	-41.989***
DR	-19.698*	-11.569	-21.291**
GO	-2.195	2.935	5.577
FS	-17.397***	-16.749***	-10.949***
FTA	-49.455**	-26.603	-27.881
QR	30.623***	38.952***	23.285***
_cons	236.284***	253.542***	-54.525
Countries	Yes	Yes	Yes
Years	Yes	Yes	Yes
Adjusted R²	0.3428	0.3841	0.6023
N	336	336	336

This table presents the robustness test for the baseline results (with GLOBE national culture dimensions), starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 to 10). Finally (column 11), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.

Appendix 14 Effect of National Culture Dimensions (WVS) on CCC

	1	2	3	4
Dependent Variables(t)	CCC	CCC	CCC	CCC
Period	2007~2021	2007~2021	2007~2021	2007~2021
National Culture Dimensions				
Survival		-4.816***		-6.456***
Traditional			1.119	5.251***
Control Variables(t-1)				
EG	112.909***	71.119**	118.298***	82.190**
CF	-38.494***	-27.028**	-37.396***	-17.969
DR	-17.435*	-20.261**	-17.026*	-19.304**
GO	-2.486	-2.442	-4.045	-9.743
FS	-16.084***	-10.989***	-16.617***	-11.760***
FTA	-35.983**	-79.624***	-33.336**	-82.056***
QR	31.920***	24.199***	31.536***	19.766***
_cons	206.485***	196.550***	209.574***	207.665***
Countries	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes
Adjusted R²	0.3401	0.376	0.3393	0.3918
N	364	364	364	364

This table presents the robustness test for the baseline results (with WVS national culture dimensions), starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 and 3). Finally (column 4), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.

Appendix 15 Effect of national culture dimension (Hofstede) on CCC (in condition of economic expansion and economic recession) within two consecutive business cycles

	1	2	3	4
Dependent Variables(t)	CCC	CCC	CCC	CCC
Period	2000~2021	2000~2021	2000~2021	2000~2021
Dummy				
Expansion		Yes	Yes	Yes
Recession		Yes	Yes	Yes
Interaction Effect				
PDI*E		0.297***		
PDI*R		0.335***		
IDV*E			-0.532***	
IDV*R			-0.552***	
MAS*E				-0.049
MAS*R				-0.025
UAI*E				
UAI*R				
LTO*E				
LTO*R				
IVR*E				
IVR*R				
Control Variables(t-1)				
EG	3.685***	3.431***	2.985***	3.700***
CF	21.152	33.889**	15.343	17.538
DR	-12.954	-3.568	14.235	-13.446
GO	4.483***	4.348***	4.391***	4.469***
FS	6.244	8.758**	7.780**	6.420
FTA	89.036***	61.838***	-16.795	91.783***
QR	3.660	4.401	5.828	4.844
_cons	-11.360	-46.118	35.568	-12.558
Countries	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes
Adjusted R²	0.2304	0.2575	0.3359	0.2258
N	363	363	363	363

This table presents the robustness test for the economic state test (Economic expansion and economic recession) results (with Hofstede national culture dimensions) in two consecutive business cycles (2000~2021). Starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 to 7). Finally (column 8), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.

**Appendix 15 (Continued) Effect of national culture dimension (Hofstede) on CCC
(in condition of economic expansion and economic recession) within two
consecutive business cycles**

	5	6	7	8
Dependent Variables(t)	CCC	CCC	CCC	CCC
Period	2000~2021	2000~2021	2000~2021	2000~2021
Dummy				
E	Yes	Yes	Yes	Yes
R	Yes	Yes	Yes	Yes
Interaction Effect				
PDI*E				-0.048
PDI*R				0.050
IDV*E				-0.783***
IDV*R				-0.676***
MAS*E				0.058
MAS*R				0.061
UAI*E	-0.167**			-0.156*
UAI*R	-0.119			-0.250***
LTO*E		0.286***		-0.153
LTO*R		0.005**		-0.199
IVR*E			-0.133	0.235
IVR*R			-0.208*	-0.023
Control Variables(t-1)				
EG	3.303***	3.072***	3.694***	2.624***
CF	11.617	33.860**	29.949*	-7.049
DR	-5.155	-10.987	-10.074	33.479**
GO	4.534***	4.476***	4.273***	4.451***
FS	5.589	0.546	7.489*	10.585**
FTA	101.315***	93.259***	77.895***	-34.875***
QR	4.088	2.677	4.383	5.855
_cons	-4.965	21.277	-10.364	42.474
Countries	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes
Adjusted R²	0.2384	0.2519	0.2336	0.353
N	363	363	363	363

This table presents the robustness test for the economic state test (Economic expansion and economic recession) results (with Hofstede national culture dimensions) in two consecutive business cycles (2000~2021). Starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 to 7). Finally (column 8), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.

Appendix 16 Effect of national culture dimension (Schwartz) on CCC (in condition of economic expansion and economic recession)

	1	2	3	4	5
Dependent Variables(t)	CCC	CCC	CCC	CCC	CCC
Period	2007~2021	2007~2021	2007~2021	2007~2021	2007~2021
Dummy					
Expansion		Yes	Yes	Yes	Yes
Recession		Yes	Yes	Yes	Yes
Interaction Effect					
Harmony*E		9.671*			
Harmony*R		5.000			
Embeddedness *E			-2.029		
Embeddedness *R			-0.995		
Hierarchy*E				11.675***	
Hierarchy*R				10.213***	
Mastery*E					38.237***
Mastery*R					45.196***
Affective Autonomy *E					
Affective Autonomy *R					
Intellectual Autonomy *E					
Intellectual Autonomy *R					
Egalitarianism *E					
Egalitarianism *R					
Control Variables(t-1)					
EG	112.909***	46.268	31.974	-24.029	2.478
CF	-38.494***	36.798**	35.402**	39.080***	80.872***
DR	-17.435*	-49.486***	-44.490***	-24.540**	-34.057***
GO	-2.486	12.373	12.010	6.452	-7.553
FS	-16.084***	-0.411	-0.318	0.505	2.502
FTA	-35.983**	54.423***	53.115**	29.967	28.253
QR	31.920***	15.020***	13.076***	9.329**	-0.316
_cons	206.485***	37.114	61.706	33.257	-128.155***
Countries	Yes	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes	Yes
Adjusted R²	0.3401	0.288	0.2753	0.3275	0.4
N	364	238	238	238	238

This table presents the robustness test for the economic state test (Economic expansion and economic recession) results (with Schwartz national culture dimensions), starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 to 8). Finally (column 9), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.

**Appendix 16 (Continued) Effect of national culture dimension (Schwartz) on CCC
(in condition of economic expansion and economic recession)**

	6	7	8	9
Dependent Variables(t)	CCC	CCC	CCC	CCC
Period	2007~2021	2007~2021	2007~2021	2007~2021
Dummy				
Expansion	Yes	Yes	Yes	Yes
Recession	Yes	Yes	Yes	Yes
Interaction Effect				
Harmony*E				61.851***
Harmony*R				57.192***
Embeddedness *E				81.725***
Embeddedness *R				66.604***
Hierarchy*E				23.178***
Hierarchy*R				16.525***
Mastery*E				67.525***
Mastery*R				63.173***
Affective Autonomy *E	5.117			43.493***
Affective Autonomy *R	8.070*			39.891***
Intellectual Autonomy *E		-4.518		0.049
Intellectual Autonomy *R		-7.174		-9.431
Egalitarianism *E			-14.151***	30.653***
Egalitarianism *R			-14.613***	21.205**
Control Variables(t-1)				
EG	51.582	13.492	-15.944	30.720
CF	23.353	38.577**	41.673***	52.800***
DR	-43.940***	-39.056***	-28.885**	-31.910***
GO	14.782	11.798	11.581	-1.881
FS	-1.747	2.940	2.827	8.117**
FTA	65.036***	36.598*	38.659**	-36.486*
QR	14.020***	10.514**	8.449**	2.231
_cons	34.918	70.185*	104.462***	-939.210***
Countries	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes
Adjusted R²	0.2867	0.2829	0.3162	0.6241
N	238	238	238	238

This table presents the robustness test for the economic state test (Economic expansion and economic recession) results (with Schwartz national culture dimensions), starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 to 8). Finally (column 9), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.

Appendix 17 Effect of national culture dimension (Hofstede) on CCC (in condition of International Covid and Pre-covid) within two consecutive business cycles

	1	2	3	4
Dependent Variables(t)	CCC	CCC	CCC	CCC
Period	2000~2021	2000~2021	2000~2021	2000~2021
Dummy				
Dummy1(Covid)		Yes	Yes	Yes
Dummy2(Pre-covid)		Yes	Yes	Yes
Interaction Effect				
PDI*Dummy1		0.281		
PDI*Dummy2		0.330***		
IDV*Dummy1			-0.527***	
IDV*Dummy2			-0.551***	
MAS*Dummy1				-0.005
MAS*Dummy2				-0.044
UAI*Dummy1				
UAI*Dummy2				
LTO*Dummy1				
LTO*Dummy2				
IVR*Dummy1				
IVR*Dummy2				
Control Variables(t-1)				
EG	3.685***	3.276***	2.836***	3.593***
CF	21.152	34.434**	15.848	17.980
DR	-12.954	-1.732	16.285	-12.114
GO	4.483***	4.369***	4.398***	4.506***
FS	6.244	9.906**	9.006**	7.530*
FTA	89.036***	64.753***	-13.921	94.988***
QR	3.660	4.620	6.110	5.086
_cons	-11.360	-58.387	22.577	-23.816
Countries	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes
Adjusted R²	0.2304	0.2599	0.3393	0.2273
N	363	363	363	363

This table presents the robustness test for the economic state test (International Covid and Pre-covid) results (with Hofstede's national culture dimensions) in two consecutive business cycles (2000~2021). Starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 to 7). Finally (column 8), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.

**Appendix 17 (Continued) Effect of national culture dimension (Hofstede) on CCC
(in condition of International Covid and Pre-covid) within two consecutive
business cycles**

	5	6	7	8
Dependent Variables(t)	CCC	CCC	CCC	CCC
Period	2000~2021	2000~2021	2000~2021	2000~2021
Dummy				
Dummy1(Covid)	Yes	Yes	Yes	Yes
Dummy2(Pre-covid)	Yes	Yes	Yes	Yes
Interaction Effect				
PDI*Dummy1				0.234
PDI*Dummy2				-0.024
IDV*Dummy1				-0.705***
IDV*Dummy2				-0.726***
MAS*Dummy1				0.248
MAS*Dummy2				0.017
UAI*Dummy1	-0.426***			-0.537***
UAI*Dummy2	-0.102*			-0.167**
LTO*Dummy1		0.379**		-0.113
LTO*Dummy2		0.248***		-0.205*
IVR*Dummy1			-0.021	0.398
IVR*Dummy2			-0.201**	0.031
Control Variables(t-1)				
EG	3.201***	3.003***	3.533***	2.458***
CF	9.355	33.929**	29.299*	-11.685
DR	-3.133	-9.685	-8.916	35.835**
GO	4.549***	4.501***	4.299***	4.504***
FS	6.049	1.225	8.309*	11.804**
FTA	104.895***	95.189***	80.799***	-28.266
QR	4.728	2.707	4.691	7.095
_cons	-13.195	13.976	-20.004	28.935
Countries	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes
Adjusted R²	0.2494	0.2529	0.2361	0.3702
N	363	363	363	363

This table presents the robustness test for the economic state test (International Covid and Pre-covid) results (with Hofstede's national culture dimensions) in two consecutive business cycles (2000~2021). Starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 to 7). Finally (column 8), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.

Appendix 18 Effect of national culture dimension (Schwartz) on CCC (in condition of International Covid and Pre-covid)

	1	2	3	4	5
Dependent Variables(t)	CCC	CCC	CCC	CCC	CCC
Period	2007~2021	2007~2021	2007~2021	2007~2021	2007~2021
Dummy					
Dummy1(Covid)		Yes	Yes	Yes	Yes
Dummy2(Pre-covid)		Yes	Yes	Yes	Yes
Interaction Effect					
Harmony*Dummy1		2.463			
Harmony*Dummy2		15.456***			
Embeddedness *Dummy1			3.753		
Embeddedness *Dummy2			0.923		
Hierarchy*Dummy1				14.790***	
Hierarchy*Dummy2				8.712***	
Mastery*Dummy1					-3.318
Mastery*Dummy2					1.502
Affective Autonomy *Dummy1					
Affective Autonomy *Dummy2					
Intellectual Autonomy *Dummy1					
Intellectual Autonomy *Dummy2					
Egalitarianism *Dummy1					
Egalitarianism *Dummy2					
Control Variables(t-1)					
EG	112.909***	126.647***	112.555***	82.389**	117.210***
CF	-38.494***	-33.019***	-38.789***	-37.291***	-38.797***
DR	-17.435*	-31.916***	-18.823**	-5.517	-18.617*
GO	-2.486	1.995	-0.960	-3.608	-2.145
FS	-16.084***	-18.756***	-16.136***	-14.112***	-16.623***
FTA	-35.983**	-33.861**	-41.721***	-46.689***	-39.488**
QR	31.920***	34.809***	30.892***	27.190***	31.321***
_cons	206.485***	166.766***	207.651***	174.383***	229.008***
Countries	Yes	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes	Yes
Adjusted R²	0.3401	0.3666	0.3373	0.3699	0.3369
N	364	364	364	364	364

This table presents the robustness test for the economic state test (International Covid and Pre-covid) results (with Schwartz's national culture dimensions). Starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 to 8). Finally (column 9), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.

**Appendix 18 (Continued) Effect of national culture dimension (Schwartz) on CCC
(in condition of International Covid and Pre-covid)**

	6	7	8	9
Dependent Variables(t)	CCC	CCC	CCC	CCC
Period	2007~2021	2007~2021	2007~2022	2007~2023
Dummy				
Dummy1(Covid)	Yes	Yes	Yes	Yes
Dummy2(Pre-covid)	Yes	Yes	Yes	Yes
Interaction Effect				
Harmony*Dummy1				16.486*
Harmony*Dummy2				40.546***
Embeddedness *Dummy1				-0.557
Embeddedness *Dummy2				26.301**
Hierarchy*Dummy1				25.691***
Hierarchy*Dummy2				27.269***
Mastery*Dummy1				-19.613
Mastery*Dummy2				16.946*
Affective Autonomy *Dummy1	1.663			9.991
Affective Autonomy *Dummy2	-0.747			15.257***
Intellectual Autonomy *Dummy1		0.151		6.763
Intellectual Autonomy *Dummy2		0.419		-2.121
Egalitarianism *Dummy1			-18.085***	-12.635
Egalitarianism *Dummy2			-4.751	21.478***
Control Variables(t-1)				
EG	114.819***	117.018***	98.207***	76.757**
CF	-39.317***	-38.837***	-36.286***	-38.056***
DR	-18.964**	-19.236**	-15.795*	-15.705
GO	-1.851	-1.615	-0.925	1.967
FS	-16.679***	-16.801***	-14.882***	-15.469***
FTA	-40.049**	-38.809**	-39.452***	-34.404**
QR	31.391***	31.513***	28.745***	34.045***
_cons	217.263***	216.534***	288.469***	-341.383**
Countries	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes
Adjusted R²	0.337	0.3366	0.3517	0.4773
N	364	364	364	364

This table presents the robustness test for the economic state test (International Covid and Pre-covid) results (with Schwartz's national culture dimensions). Starting with the controls-only estimation (column 1), then adding national culture dimensions one by one individually (columns 2 to 8). Finally (column 9), a joint estimation with all variables is presented. Standard errors are in parenthesis. *** Significant at the 0.01 level; ** Significant at the 0.05 level; * Significant at the 0.10 level.